DEPARTMENT OF THE ARMY TECHNICAL MANUAL TM 11-5820-222-10

DEPARTMENT OF THE AIR FORCE TECHNICAL ORDER TO 31R2-2TRC68-1

OPERATOR'S MANUAL

RADIO SETS AN/VRC-24 AND AN/TRC-68

DEPARTMENTS OF THE ARMY AND THE AIR FORCE

7 JUNE 1960

WARNING

DANGEROUS VOLTAGES EXIST AT ANTENNA AND AC POWER CONNECTORS

Be careful when working around the antenna or the antenna connectors, as high radiofrequency voltages exist at these points. Be careful when working on the ac power connector to Receiver-Transmitter Case CY-2712/TRC-68. Serious injury or death may result from contact with these connectors.

DEPARTMENT OF THE ARMY TECHNICAL MANUAL

*TM 11-5820-222-ESC/1

EQUIPMENT SERVICEABILITY CRITERIA FOR RADIO SETS AN/VRC-24 AND AN/VRC-24A

Headquarters, Department of the Army, Washington, D. C., 20 May 1969

		Paragraph
SECTION I.	INSTRUCTIONS	1-4
II.	EVALUATION PROCEDURE	5,6

Section I. INSTRUCTIONS

1. Purpose. This manual furnishes the user with a procedure for evaluating the readiness condition of the equipment to perform satisfactorily its primary mission for 90 days with normal maintenance support. Application of this procedure, however, does not eliminate or reduce the requirement for prescribed maintenance service on the equipment, and does not authorize replacement of components.

2. Definitions. *a. Equipment Category* **GREEN.** Equipment free of condition that would limit the reliable performance of its primary mission for a period of 90 days of operation.

b. Equipment Category **AMBER.** Operationally ready equipment that possesses a limiting factor(s) which may curtail a reliable performance of its primary mission for a period of 90 days of operation.

c. Equipment Category **RED.** Equipment unable to perform its primary mission immediately or possessing an unacceptable reliability for sustained performance (90 days) of its primary mission.

3. General Instructions. *a.* This evaluation will be performed by the operator.

b. This technical manual will be filed with the equipment log.

c. This evaluation will be actually performed on the item(s) being rated.

d. Equipment serviceability criteria items covered in this manual, but not authorized to the evaluating organization, shall be scored as "GREEN."

e. Authorized end items not on hand shall be scored as "RED."

f. This equipment is rated on the basis of capability for

*This manual supersedes TM 11-5820-222-ESC/1, 2 June 1964.

immediate operation and amount of wear life remaining on time change components. The rating is not meaningful unless each check is made with the utmost care and accuracy.

g. Record the evaluation results on DA Form 2404 (Equipment Inspection and Maintenance Worksheet) using a separate sheet for each multiple-aspect equipment, subsystem and/or component, including those evaluated by separately published equipment serviceability criteria technical manuals. The blocks will be completed as shown below:

(1) *Block 1.* Insert the organizational designation of the unit performing the evaluation.

(2) *Block 2.* Radio Sets AN/VRC-24 or AN/VRC-24A.

(3) *Block 3.* Insert the registration, serial, or Federal stock number, as appropriate. Do not use more than one number.

(4) *Block 4.* N/A.

(5) *Block 5.* Insert the standard six-digit calendar date that equipment serviceability criteria evaluation is performed (example: 3 January 1969 would be 690103).

(6) *Block 6.* Insert the letters "ESC."

(7) *Block 7.* Insert the equipment serviceability criteria technical manual number and its date of issue.

(8) *Column a.* Insert the checkpoint item number.

(9) *Column b.* Place each obtained color rating opposite the item to which it applies. (Insert **"GREEN," "AMBER,"** or **"RED,"** as applicable.)

(10) *Column c.* Briefly describe each test item.

(11) Obtain the color rating for each subsystem by taking the lowest color rating given.

(12) *Blocks 8 and 9.* Self-explanatory.

(13) *Block 10.* Insert the subsystem color categorization.

(14) The color category for mulitple-aspect equipment will not be rated any higher than the lowest-rated subsystem and/or component. Indicate this classification at the bottom of the basic evaluation sheet thus: SYSTEM EVALUATION. (Insert **GREEN, AMBER,** or **RED.**) The color rating will be kept current by recording changes as they occur on DA Form 2404.

(15) Staple all forms applying to the same system together, with those which apply to the basic system on top.

h. Determine and record the appropriate rating for each checkpoint, each subsystem/component, and the system. The color rating for multiple-aspect equipment will be the lowest rating recorded for a subsystem/component.

Note. If an URGENT modification work order has not been applied to any authorized equipment, the equipment and the system will be rated **"RED."**

i. Subsystems and components will be separately color rated.

j. A color rating will be assigned for the overall system.

4. Reporting of Errors. The reporting of errors, omissions, and recommendations for improving this publication by the individual user is encouraged. Reports should be submitted on DA Form 2028 (Recommended Changes to DA Publications) and forwarded direct to Commanding General, U. S. Army Electronics Command, ATTN: AMSEL-ME-NMP-AD, Fort Monmouth, N. J. 07703.

Section II. EVALUATION PROCEDURE

5. Test Requirements. *a. Operating Conditions.*

(1) Vehicle engine is operating.
(2) A monitor radio set is located approximately 1 mile from the equipment under test.
(3) No steel structures or hills lie between the monitor radio set and the equipment under test.
(4) Connect the loudspeaker and the microphone to the AUDIO receptacle on the receiver-transmitter.

b. Preliminary Control Settings on RT-323/VRC-24.

(1) POWER switch momentarily set to OFF and released.
(2) CHAN SEL switch at position 1.
(3) MANUAL FREQUENCY (TENS, UNITS, TENTHS) knobs in any position.
(4) SQUELCH control at OFF.
(5) VOLUME control at midposition.
(6) METER switch set to LINE V.
(7) PRESET CHANNEL indicator indicates channel to which previously tuned.
(8) FREQ indicators indicate the frequency to which previously tuned.
(9) Turn the POWER switch to ON and release.
(10) Turn the SQUELCH control clockwise until the CALL LIGHT lamp goes out.
(11) Press and release the SQUELCH DISABLE-PUSH switch.

c. Preliminary Control Settings on C-1439/U.

(1) POWER switch momentarily set to OFF and released.
(2) SPEAKER VOLUME control at midposition.
(3) CHANNEL selector switch at position 1.
(4) SQUELCH control at OFF.
(5) PHONE VOLUME control at midposition.

6. Procedure. *a. Information to be Determined by Inspection and Operation.* Evaluate each item listed and record the proper color rating on DA Form 2404 as described in section I.

ITEM 1. MWO's.

Determine whether URGENT MWO's have been applied.

Condition	URGENT MWO not applied.
Rating	RED

b. Operation from Receiver-Transmitter.

ITEM 2. CHAN SEL Switch on MANUAL.

Turn the CHAN SEL switch to MANUAL.

Condition	The preset channel memory drum rotates to position M, and PRESET CHANNEL window indicates M. Frequency indicated in FREQ window agrees with MANUAL FREQUENCY switch settings.	The preset channel memory drum does not rotate to position M. Frequency indicated in FREQ window does not agree with MANUAL FREQUENCY switch settings.
Rating	GREEN	RED

ITEM 3. Communications Check.

With the CHAN SEL switch at MANUAL, turn SQUELCH control counterclockwise until CALL LIGHT lamp glows. Press microphone push-to-talk switch; call monitor operator and ask him to transmit.

Condition	CALL LIGHT lamp goes out, noise in loudspeaker disappears. Monitor's transmitter is heard loud and clear, and monitor operator reports hearing signal loud and clear.	CALL LIGHT lamp does not go out, and noise in loudspeaker does not disappear.	Monitor operator's signals are not received, or he reports no signal or unreadable signal.
Rating	GREEN	AMBER	RED

ITEM 4. CHAN SEL Switch.

Turn the CHAN SEL switch to a different channel.

Condition	Frequency selector motor runs until a different channel is selected. Channel number selected is indicated in PRESET CHANNEL window. Frequency indicated in FREQ window agrees with that marked on the chart.	Frequency selector motor does not run. Frequency indicated in FREQ window does not agree with that marked on the chart.
Rating	GREEN	RED

c. Operation from Radio Set Control.

(1) Set the receiver-transmitter CHAN SEL switch to REMOTE PRESET.
(2) Move the audio accessories to the radio set control.
(3) Turn the radio set control POWER switch to ON.
(4) Set the radio-interphone switch to RAD.
(5) Turn the SQUELCH control clockwise, and press and release the SQUELCH DISABLE-PUSH switch.

ITEM 5. CHANNEL Selector Switch.

Select a preset channel with the CHANNEL selector switch.

Condition	Frequency selector motor runs until channel is selected. Channel number is indicated in PRESET CHANNEL window, and frequency is indicated in FREQ windows *or* receiver-transmitter.	Frequency selector motor does not run, and a channel is not selected.
Rating	GREEN	AMBER

ITEM 6. Communicating With Monitor Receiver-Transmitter.

Call the monitor receiver-transmitter on several preset channels, in turn, and observe the quality of transmissions.

Condition	Monitor receiver-transmitter reports received voice signals loud and clear. Signals transmitted by monitor receiver-transmitter are received loud and clear. CALL LIGHT lamp glows, depending on setting of SQUELCH control.	CALL LIGHT lamp does not go out, and noise in loudspeaker does not disappear. Monitor operator's signals are not received, or he reports no signal or unreadable signal.
Rating	**GREEN**	**AMBER**

d. Equipment Rating. The color rating will be the lowest rating recorded above.

By Order of the Secretary of the Army:

W. C. WESTMORELAND,
General, United States Army,
Chief of Staff.

Official:

KENNETH G. WICKHAM,
Major General, United States Army,
The Adjutant General.

Distribution:

To be distributed in accordance with DA Form 12-51 (qty rqr Block No. 642), Organizational maintenance requirements for AN/VRC-24 radio set.

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No. 11-5820-222-10

TECHNICAL ORDER
No. 31R2-2TRC68-1

DEPARTMENTS OF THE ARMY
AND THE AIR FORCE

WASHINGTON 25, D. C., *7 June 1960*

RADIO SETS AN/VRC-24 AND AN/TRC-68

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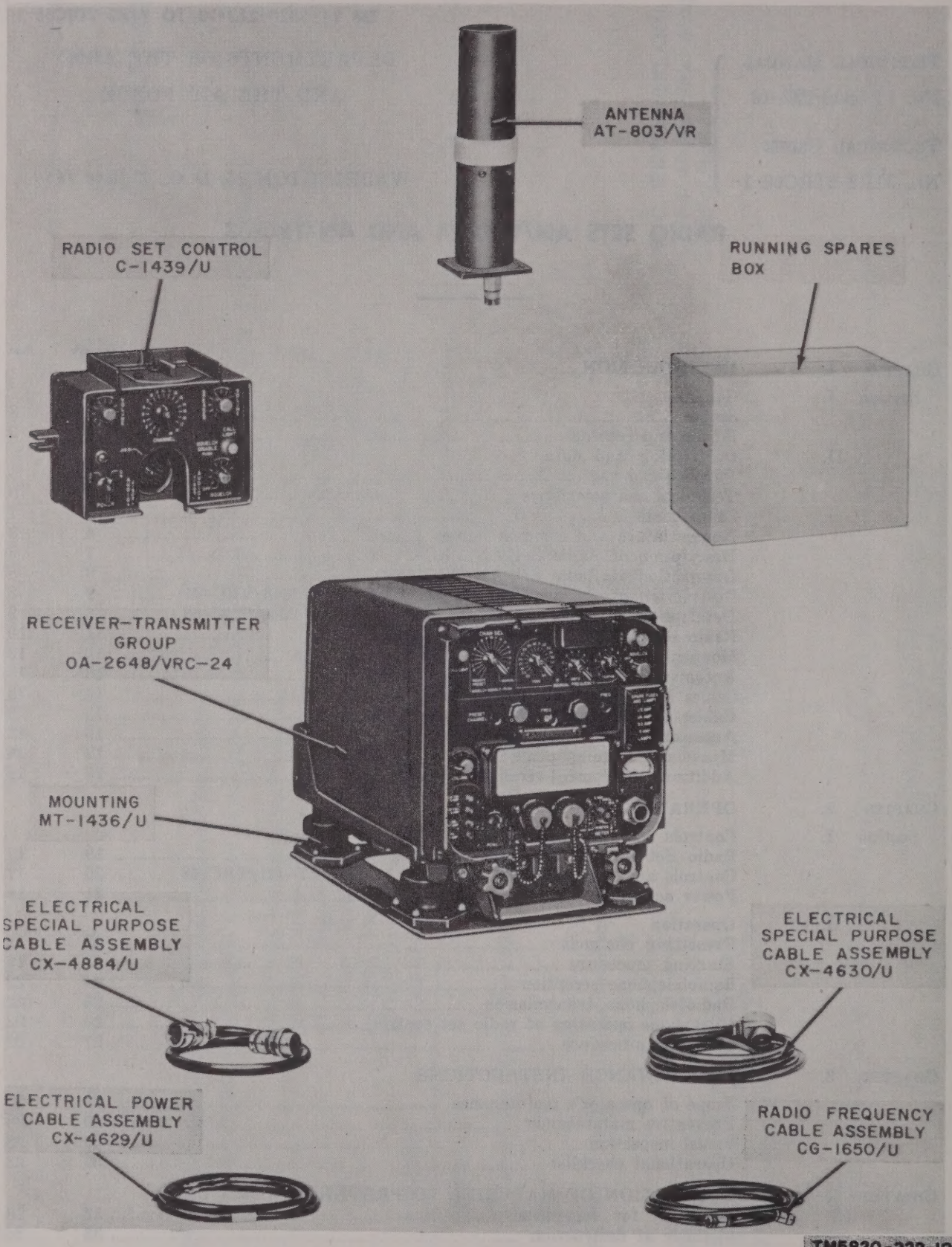

Figure 1. Radio Set AN/VRC–24, major components.

CHAPTER 1
INTRODUCTION

Section I. GENERAL

1. Scope

This manual describes Radio Sets AN/VRC-24 (fig. 1) and AN/TRC-68 (fig. 2) and covers the operation and operator's maintenance of the radio sets. It includes operation, first echelon maintenance, and replacement of parts available to first echelon. Appendix I contains a list of references.

2. Forms and Records

a. Unsatisfactory Equipment Reports.

(1) Fill out and forward DA Form 468 (Unsatisfactory Equipment Report) to the Commanding Officer, U. S. Army Signal Equipment Support Agency, Fort Monmouth, N. J., as prescribed in AR 700-38.

(2) Fill out and forward AF TO Form 29 (Unsatisfactory Report) to the Commander, Air Materiel Command, Wright-Patterson Air Force Base, Ohio, as prescribed in AF TO 00-35D-54.

b. Report of Damaged or Improper Shipment. Fill out and forward DD Form 6 (Report of Damaged or Improper Shipment) as prescribed in AR 700-58 (Army) and AFR 71-4 (Air Force).

c. Preventive Maintenance Forms. Prepare DA Form 11-238 (fig. 17) (Maintenance Check List for Signal Equipment (Sound Equipment, Radio, Direction Finding, Radar, Carrier, Radiosonde and Television)), in accordance with instructions on the form.

d. Parts List Form. Forward DA Form 2028 (Recommended Changes to DA Technical Manual Parts Lists or Supply Manuals 7, 8, and 9) directly to the Commanding Officer, U. S. Army Signal Equipment Support Agency, Fort Monmouth, N. J., with comments on parts listings.

e. Comments on Manual. Forward all other comments on this publication direct to the Commanding Officer, U. S. Army Signal Publications Agency, Fort Monmouth, N. J.

Section II. DESCRIPTION AND DATA

3. Purpose and Use

a. Radio Sets AN/VRC-24 and AN/TRC-68 operate on 1,750 crystal-controlled channels within the frequency range of 225.0 to 399.9 megacycles (mc). The sets provide for the transmission and reception of amplitude-modulated (am) radiotelephone signals for ground-to-air liaison. The sets may also be used to transmit and receive encoded voice signals.

b. The AN/VRC-24 is used for vehicular ground-to-air communications. It may also be used as a retransmission device for Radio Sets AN/GRC-3 through -8 (TM 11-284) when connected as shown in figure 3. Audio output from the AN/VRC-24 receiver frequency-modulates the transmitter of one of the AN/GRC-3 through -8 series for retransmission. Audio output from the AN/GRC-3 through -8 receiver amplitude-modulates the transmitter of the AN/VRC-24.

c. The AN/TRC-68 is used for ground-to-air radio communications from a stationary location. It can be vehicular mounted if a suitable 115-volt or 230-volt alternating current (ac) power source is available. Control Group AN/GRA-6 (TM 11-5038) is provided to control and operate the AN/TRC-68 from a remote position (fig. 4).

4. Technical Characteristics

Frequency range .....225.0 mc to 399.9 mc.

Type of modulation .....Am.

Type of transmission .....Voice.

Number of channels .....1,750.

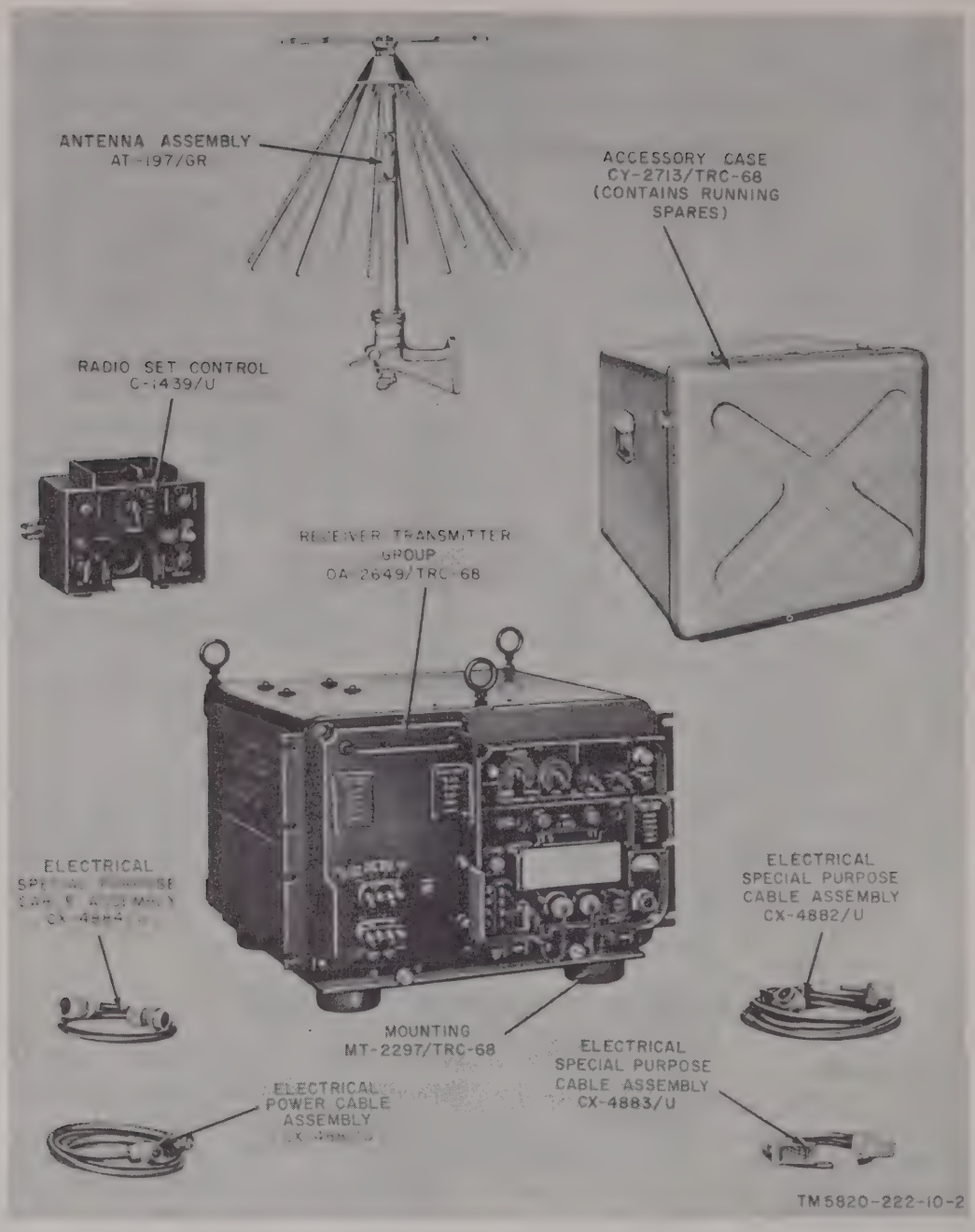

Figure 2. Radio Set AN/TRC–68, major components.

Number of preset channels .....19.
Channel spacing .....100 kc between channels.
Time required to preset channel .....Approximately 10 sec.
Channel selection time .....5 sec maximum.
Number of tubes .....29.
Number of crystals .....35.

Power requirements .....250 watts receiving, 300 watts transmitting, unmodulated.

Power source .....AN/VRC–24; 24-volt vehicular battery.

AN/TRC–68; 115- or 230-volt, 50/60-cps, single-phase.

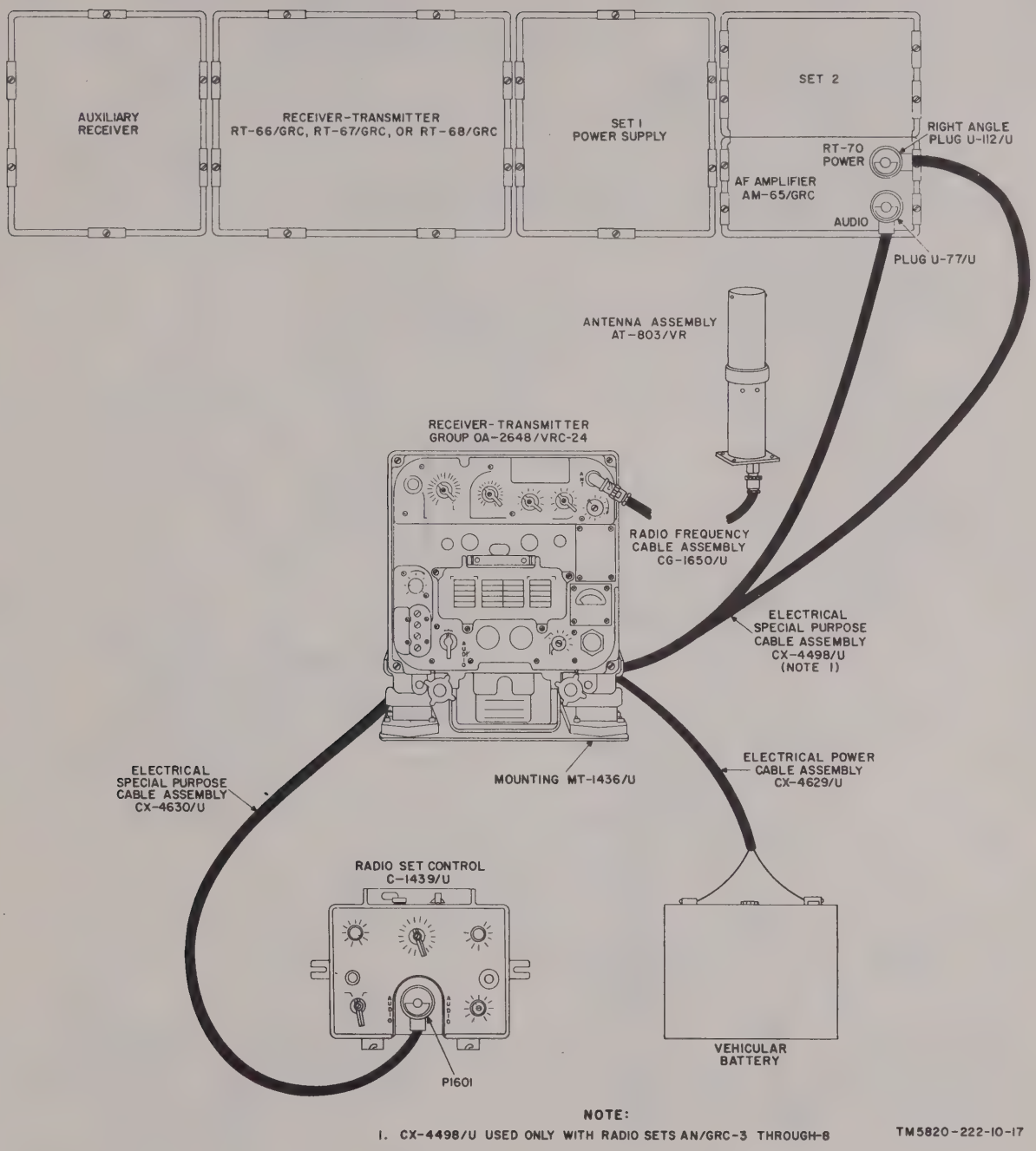

Figure 3. Radio Set AN/VRC–24 as used with Radio Sets AN/GRC–3 through –8, cording diagram.

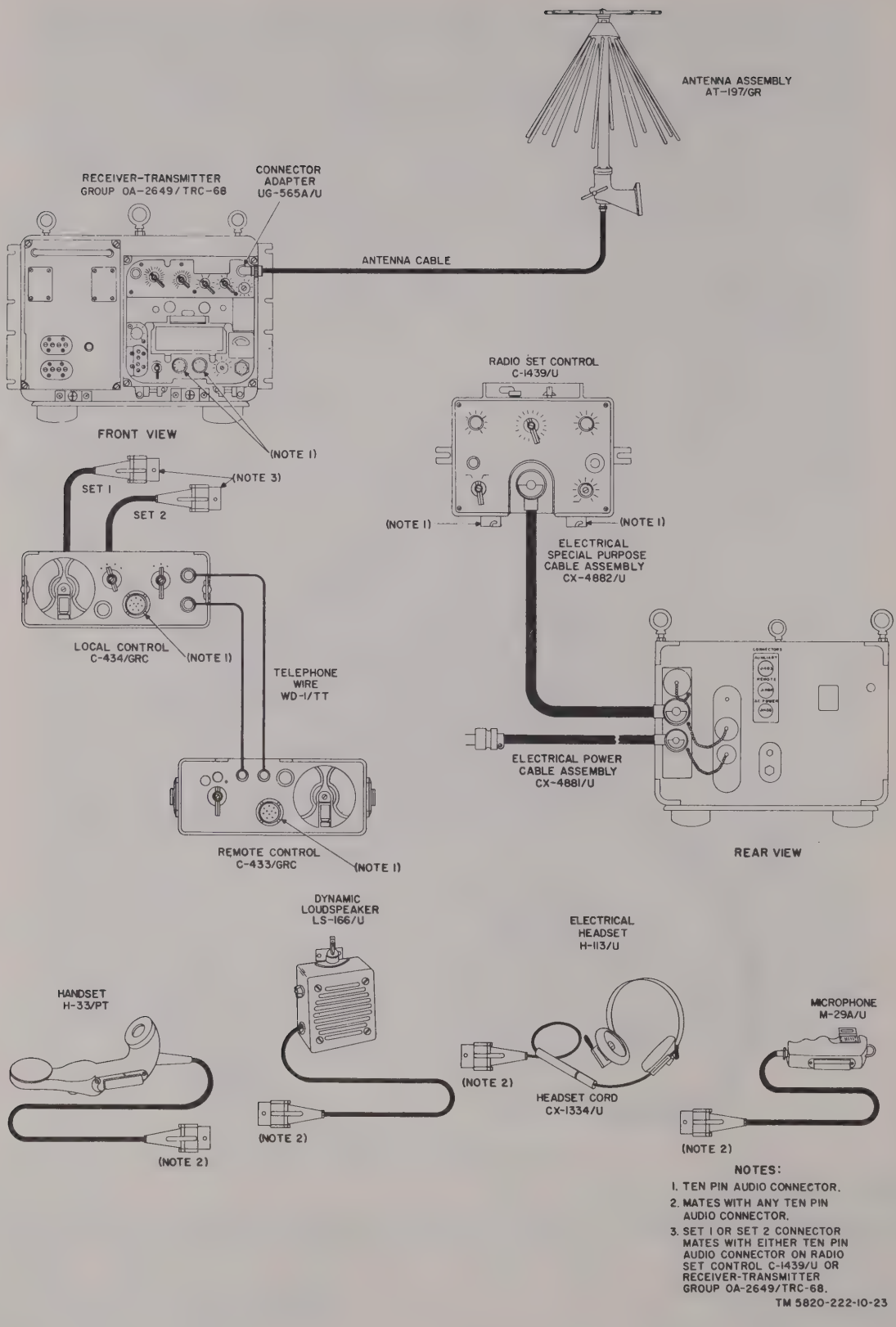

Figure 4. Radio Set AN/TRC-68, cording diagram.

5. Components

a. Radio Set AN/VRC-24.

Quantity	Item	Fig. No.	Height (in.)	Depth (in.)	Width (in.)	Unit weight (lb)
1	Receiver-Transmitter Group OA-2648/VRC-24 including:	1	12	15	10	62
1	Receiver-Transmitter RT-323/VRC-24	5	10	15½	9½	48
1	Dynamotor DY-151/U	5	3½	10	3½	6.5
1	Receiver-Transmitter Case CY-2557/VRC-24	5	12	16½	10⅝	8
1	Mounting MT-1436/U	1	5¾	18	10½	20
1	Radio Set Control C-1439/U	1	6½	2⅞	6½	5
1	Antenna AT-803/VR	1	11	3	2¾	
1	Radio Frequency Cable Assembly CG-1650/U	1	6 ft (lg)			
1	Electrical Power Cable Assembly CX-4629/U	1	8 ft (lg)			
1	Electrical Special Purpose Cable Assembly CX-4630/U	1	10 ft (lg)			
1	Electrical Special Purpose Cable Assembly CX-4884/U	1	3 ft (lg)			
1	Dynamic Loudspeaker LS-166/U	11	5	5½	3½	1
1	Microphone M-29A/U	11				
1 set	Running spares (*c* below)	10				
2	TM 11-5820-222-10	11	10½		8	
2	TM 11-5820-222-20	11	10½		8	

b. Radio Set AN/TRC-68.

Quantity	Item	Fig. No.	Height (in.)	Depth (in.)	Width (in.)	Unit weight (lb)
1	Receiver-Transmitter Group OA-2649/TRC-68 including:	2	12	20	18¼	155.6
1	Receiver-Transmitter RT-441/TRC-68	6	10	15½	9½	48.8
1	Centrifugal Fan HD-390/U	6	3½	9½	3½	6
1	Receiver-Transmitter Case CY-2712/TRC-68	6	12½	20	19¼	553
1	Power Supply PP-1494/U	6	12	18¾	7⅛	57.5
1	Mounting MT-2297/TRC-68	6				
1	Radio Set Control C-1439/U	2	6½	2⅞	6½	5
1	Accessory Case CY-2713/TRC-68	2	23	24	26½	93.5
1	Electrical Power Cable Assembly CX-4881/U	2	25 ft (lg)			2.3
1	Electrical Special Purpose Cable Assembly CX-4882/U	2	20½ ft (lg)			
1	Electrical Special Purpose Cable Assembly CX-4883/U	2	3 ft (lg)			
1	Electrical Special Purpose Cable Assembly CX-4884/U	2	3 ft (lg)			
1	Connector Adapter UG-565A/U	9				
1	Antenna Assembly AT-197/GR	2				
1	Control Group AN/GRA-6 including:	12				
1	Remote Control C-433/GRC	12	3½	7 3/32	8¼	7
1	Local Control C-434/GRC	12	3½	10⅛	8 9/16	10½
1	Handset H-33/PT	12				
1	Bad CW-189/GR	12				
1	Electrical Headset H-113/U	9				
1	Headset Cord CX-1334/U	9				
1	Dynamic Loudspeaker LS-166/U	11	5	5½	3½	1
1	Microphone M-29A/U	11				
1	Spool DR-8-A and Wire WD-1/TT	9				
1 set	Running spares (*c* below)	10				
2	TM 11-5820-222-10	11	10½		8	
2	TM 11-5820-222-20	11	10½		8	

c. Running Spares (fig. 10).

(1) *AN/VRC-24.*

Quantity	Item
2	Electron tube, 5763
3	Electron tube, 5654/6AK5W
2	Electron tube, 5670
2	Electron tube, 6J4WA
1	Electron tube, 4X150D
1	Electron tube, 6442
1	Electron tube, 7554
2	Lamp, LM-327
3	Fuse, 5-ampere, 32-vdc
3	Fuse, 30-ampere, 32-vdc
5	Fuse, ¼-ampere, 250-vdc
5	Fuse, ½-ampere, 250-vdc

(2) *AN/TRC-68.*

Quantity	Item
2	Electron tube, 5763
3	Electron tube, 5654/6AK5W
2	Electron tube, 5670
2	Electron tube, 6J4WA
1	Electron tube, 4X150D
1	Electron tube, 6442
1	Electron tube, 7554
3	Lamp, LM-327
3	Fuse, 30-ampere, 32-vdc
5	Fuse, 15-ampere, 250-vdc
3	Fuse, 5-ampere, 32-vdc
5	Fuse, 3-ampere, 125-vdc
5	Fuse, 1.5-ampere, 125-vdc
5	Fuse, ¾-ampere, 250-vdc
5	Fuse, ½-ampere, 250-vdc
5	Fuse, ¼-ampere, 250-vdc
5	Fuse, ⅛-ampere, 250-vdc
5	Fuse, 5-ampere, 125-vdc

6. Nomenclature and Common Names

A list of components of Radio Sets AN/VRC-24 and AN/TRC-68 to which common names have been assigned is given below.

Nomenclature	Common name
Receiver-Transmitter Case CY-2557/VRC-24	RT-323/VRC-24 case
Dynamotor DY-151/U	Dynamotor
Radio Set Control C-1439/U	Radio set control
Receiver-Transmitter Case CY-2712/TRC-68	AN/TRC-68 case
Power Supply PP-1494/U	Power supply
Centrifugal Fan HD-390/U ..	RT blower
Accessory Case CY-2713/TRC-68	Accessory case
Electrical Headset H-113/U	Headset
Dynamic Loudspeaker LS-166/U	Loudspeaker

7. Description of Radio Set AN/VRC-24

The AN/VRC-24 includes a receiver-transmitter group, a mounting, a radio set control, an antenna, a loudspeaker, a microphone, and interconnecting cable assemblies. The receiver-transmitter group (fig. 1) is secured to the mounting which is normally bolted to a vehicular mounting surface. The cable assemblies interconnect components of the radio set and connect the radio set to the vehicular battery (fig. 3). The actual location of the components in a vehicle depends upon the vehicle and is limited by the lengths of the cable assemblies.

8. Description of Radio Set AN/TRC-68 (fig. 2)

a. The AN/TRC-68 includes a receiver-transmitter group, an antenna, a mounting, a radio set control, and an accessory case containing the interconnecting cable assemblies and the remaining components of the radio set.

b. The receiver-transmitter group is secured to the mounting which may be bolted to a mounting surface. Connections to the power source and radio set control are made at the rear of the receiver-transmitter group case. The interconnecting cable from the antenna is connected to the ANT connector on the front panel of the receiver-transmitter. When the AN/GRA-6 is used, Local Control C-434/GRC is connected directly to the radio set control and through a telephone wire to Remote Control C-433/GRC. The C-434/GRC and the C-433/GRC are components of the AN/GRA-6.

9. Description of Receiver-Transmitter Group OA-2648/VRC-24 (fig. 5)

The OA-2648/VRC-24 consists of a receiver-transmitter, a dynamotor (mounted on the receiver-transmitter) and a case. All operating controls, meter, indicator lamps, and fuses are located on the front panel of the receiver-transmitter. An access plate covers the spare fuse and lamp compartment. An access door covers the memory drum and provides a space for recording the frequencies of the preset channels. Receptacles are provided on the front panel for connection to a microphone, loudspeaker or headset, antenna, and to security equipment. All other connections are made at

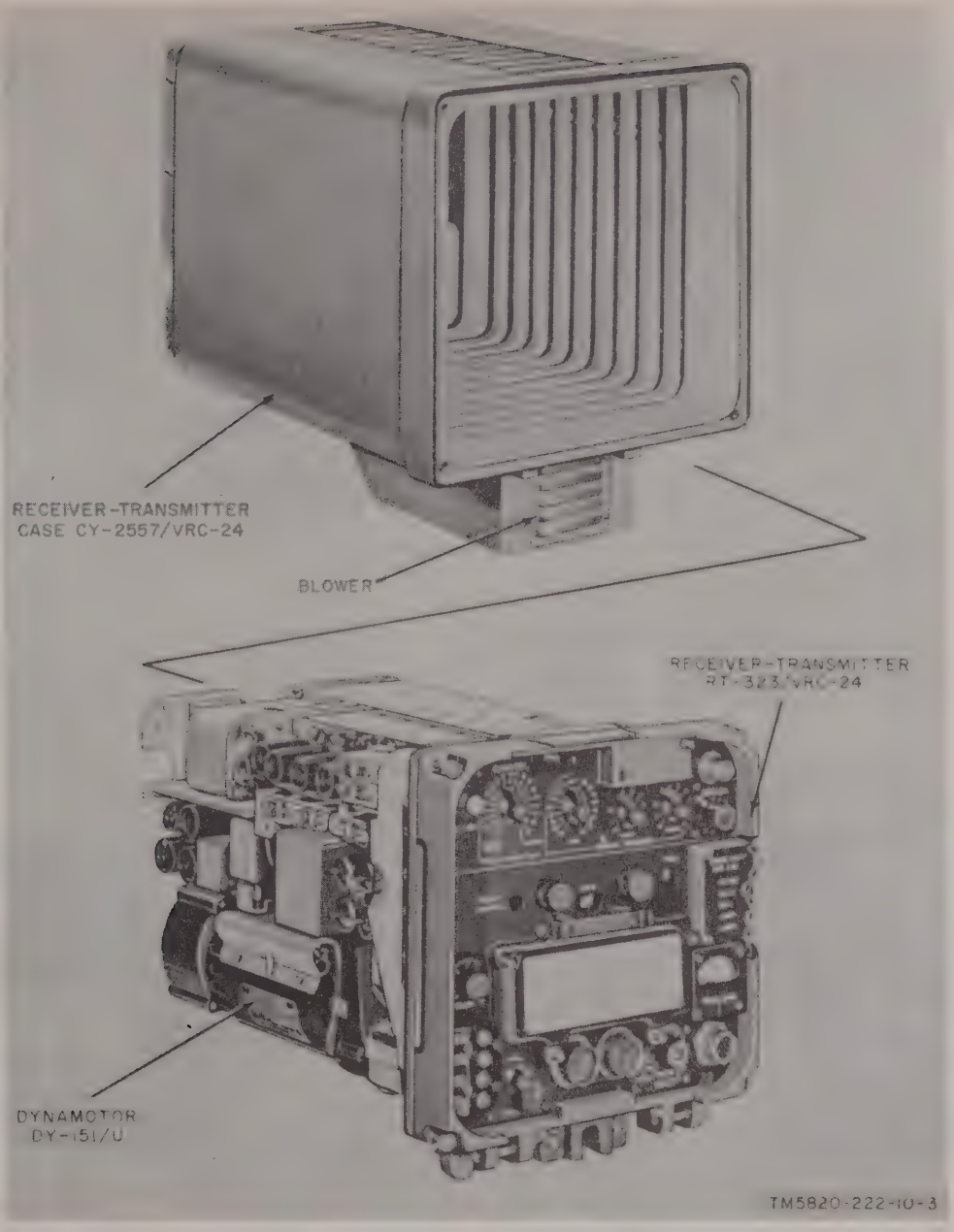

Figure 5. Receiver-Transmitter Group OA–2648/VRC–24.

the rear of the receiver-transmitter. A blower is fastened to the underside of the case. The dynamotor is connected to the vehicular battery and generates the necessary operating voltages for the receiver-transmitter.

10. Description of Receiver-Transmitter Group OA-2649/TRC-68

(fig. 6)

The OA-2649/TRC-68 consists of a receiver-transmitter, a power supply, and a case. The receiver-transmitter is the same as the receiver-transmitter of the AN/VRC-24 (par. 9) except that a blower is mounted in place of the dynamotor and the number of fuses on the front panel is different. The power supply operates from either a 115-volt or 230-volt ac source and contains the remaining fuses for the radio set. The case is divided into two compartments, one for the power supply, the

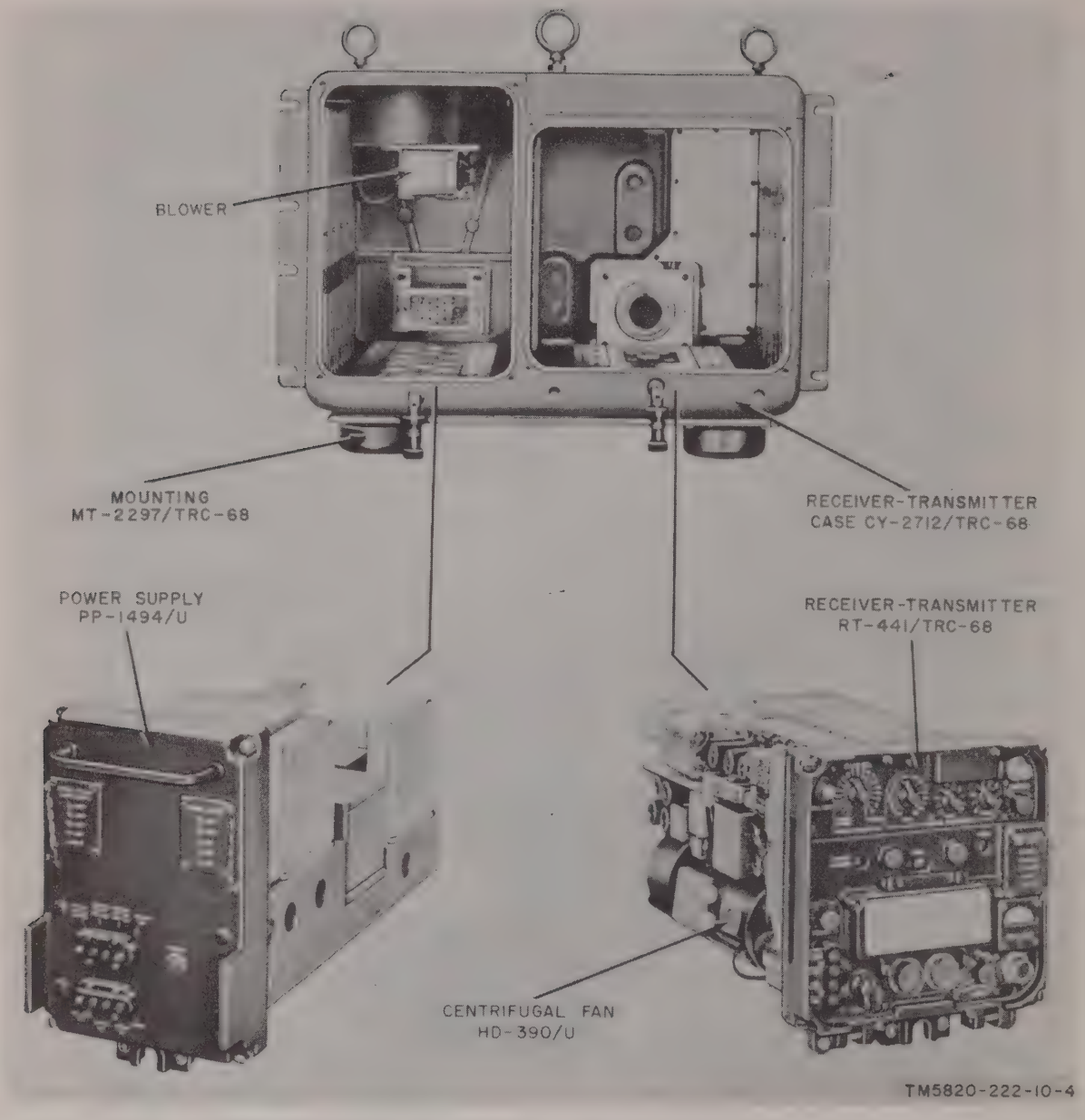

Figure 6. Receiver-Transmitter Group OA–2649/TRC–68 and Mounting MT–2297/TRC–68.

other for the receiver-transmitter. A blower is mounted at the rear of the power supply compartment. The louvered sides of the case are covered with plates to make the unit immersion proof. The plates are removed when operating.

11. Radio Set Control C-1439/U
(fig. 1 and 13)

The radio set control contains controls which permit operation of the radio set from a position at a short distance away from the receiver-transmitter. The radio set control may be used for radio, interphone, or simultaneous radio and interphone operation. Receptacles at the bottom of the radio set control provide connections for a microphone and either a loudspeaker or headset. In the AN/TRC-68, these receptacles also provide connections to Local Control C-434/GRC of the AN/GRA-6.

DEPARTMENT OF THE ARMY TECHNICAL MANUAL
DEPARTMENT OF THE AIR FORCE TECHNICAL ORDER

TM 11-5820-222-10
TO 31R2-2TRC68-1
C 6

Operator's Manual

RADIO SETS AN/VRC-24, AN/VRC-24A, AN/TRC-68 AND AN/TRC-68A

TM 11-5820-222-10
TO 31R2-2TRC68-1
CHANGES No. 6

DEPARTMENTS OF THE ARMY
AND THE AIR FORCE
WASHINGTON 25, D.C., *12 April 1963*

TM 11-5820-222-10/TO 31R2-2TRC68-1, 7 June 1960, is changed as follows:

Note. The parenthetical reference to previous changes (example: "page 1 of C 3") indicates that pertinent material was published in that changes.

Page 3. Make the following changes:
Add paragraph 1.1 after paragraph 1.

1.1. Index of Publications

Refer to the latest issue of DA Pam 310-4 to determine whether there are new editions, changes, or additional publications pertaining to your equipment. DA Pam 310-4 is an index of current technical manuals, technical bulletins, supply bulletins, lubrication orders, and modification work orders that are available through publications supply channels. The index lists the individual parts (-10, -20, -35P, etc.) and the latest changes to and revisions of each equipment publication.

Paragraph 2 (page 1 of C 2). Delete paragraph 2 and substitute:

2. Forms and Records

a. Reports of Maintenance and Unsatisfactory Equipment. Use equipment forms and records in accordance with instructions in TM 38-750.

b. Report of Damaged or Improper Shipment. Fill out and forward DD Form 6 (Report of Damaged or Improper Shipment) as prescribed in AR 700-58 (Army), NAVSANDA Publication 378 (Navy), and AFR 71-4 (Air Force).

c. Comments on Manual. Forward all comments on this publication direct to: Commanding Officer, U.S. Army Electronics Materiel Support Agency, ATTN: SELMS-MP, Fort Monmouth, N.J. DA Form 1598 (Record of Comments on Publications), DA Form 2496 (Disposition Form), or letter may be used.

Paragraph 2.1 (page 1 of C 3). Delete paragraph 2.1.

Page 23. Make the following changes:
Delete paragraph 29 and substitute:

29. Preventive Maintenance

Preventive maintenance is the systematic care, servicing, and inspection of equipment to prevent the occurrence of trouble, to reduce downtime, and to assure that the equipment is serviceable.

a. Systematic Care. The procedures given in paragraphs 29.1 and 29.2 cover systematic care essential to proper upkeep and operation of the equipment. The cleaning operations (par. 29.3) should be performed once a day. If the equipment is not used daily, the cleaning operations must be performed before operation after any extended shutdown, or once a week while the equipment is kept in a *standby* condition. The other items must be checked before the equipment is placed in operation after a shutdown, during operation, or after it is turned off, as specified in the applicable paragraph.

b. Maintenance Service and Inspection. The maintenance and service inspection chart (par. 29.2) outlines inspections to be made at specific intervals. These inspections are made to determine combat serviceability; that is, to determine that the equipment is in good general (physical) condition and is in good operating condition. To assist operators in maintaining

combat serviceability, the chart indicates what to inspect, how to inspect, and what the normal conditions are; the "*References*" column lists the paragraph or figure that contains the additional information. If the defect cannot be remedied by the operator, higher maintenance or repair is required. Records of these inspections must be made in accordance with TM 38–750.

Add paragraphs 29.1 through 29.3 after paragraph 29.

29.1. Maintenance Service and Inspection Periods

Maintenance service and inspections of the AN/VRC–24 and AN/TRC–68 are required on a daily basis.

a. Paragraph 29.2 specifies services and inspections that must be accomplished daily and under special conditions listed below.

(1) *Vehicular installations.*

(*a*) Before the vehicle starts on a mission.

(*b*) When the equipment is initially installed.

(*c*) When the equipment is reinstalled after removal for any reason.

(*d*) At least once a week if the equipment is maintained in a standby condition.

(2) *Transportable and mobile installations.*

(*a*) When the equipment is initially installed.

(*b*) When the equipment is reinstalled after removal for any reason.

(*c*) At least once each week if the equipment is maintained in a standby condition.

b. Paragraph 29.3 specifies maintenance services that must be performed once each week. If the equipment is being maintained in a standby condition, the daily (par. 29.2) and the weekly (par. 29.3) services and inspections should be accomplished at the same time.

29.2. Daily Maintenance Service and Inspection Chart

Item No.	Procedure		References
	Item	Normal condition or result	
1	SET: Inspect the equipment for—		
	a. Completeness	*a.* Equipment must be complete	*a.* App. II.
	b. Proper installation	*b.* Equipment is properly installed	*b.* None.
	c. Cleanliness	*c.* Units must be clean and dry and free of grease, dirt, rust, corrosion, and fungus.	*c.* Par. 29.4
	d. Preservation	*d.* Painted surfaces must be free of bare spots, rust, and corrosion.	*d.* None.
2	OPERATIONAL TEST: Perform the steps as given in the checklist.	Normal indications as given in this checklist must be obtained.	Par. 31*c*.
3	CONTROLS: Inspect controls for normal operation. Tap controls lightly for evidence of cutout from loose contacts.	All controls operate normally; there is no indication of cutout when they are tapped.	Fig. 13.

29.3. Cleaning

Inspect the exterior of the radio set. The exterior should be clean and free from dust, dirt, grease, and fungus.

Warning: **Cleaning compound is flammable and its fumes are toxic. Provide adequate ventilation.** ***Do not*** **use near a flame.**

a. Remove dirt and dust with a clean soft cloth. Dampen the cloth with Cleaning Compound (Federal stock No. 7930–395–9542), if necessary.

b. Remove grease, fungus, and ground-in dirt from the cases; use a cloth dampened (not wet) with cleaning compound.

c. Remove dust and dirt from plugs and jacks with a brush.

d. Remove dirt and dust from the meter face glass with a cloth dampened with cleaning compound.

Caution: **Do not press hard on the meter glass; this could damage the meter.**

e. Clean the panels and control knobs; use a soft clean cloth. If dirt is difficult to remove, dampen the cloth with water; mild soap may be used to make cleaning more effective.

Page 24. Delete figure 17.

Page 27, appendix I. Add the following:

TM 38–750. The Army Equipment Record System and Procedures.

By Order of the Secretaries of the Army and the Air Force:

EARLE G. WHEELER,
General, United States Army,
Chief of Staff.

Official:

J. C. LAMBERT,
Major General, United States Army.
The Adjutant General.

CURTIS E. LEMAY,
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NG: State AG (3); units—same as Active Army except allowance is one copy for each unit.

USAR: None.

For explanation of abbreviations used, see AR 320–50.

U.S. GOVERNMENT PRINTING OFFICE: 1970—816-413/45

826–438

TM 11-5820-222-10
*C 9

CHANGE
NO. 9

HEADQUARTERS
DEPARTMENT OF THE ARMY
WASHINGTON, D. C., *23 July 1968*

Operator's Manual

RADIO SETS AN/VRC-24, AN/VRC-24A, AN/TRC-68, AND AN/TRC-68A

TM 11-5820-222-10, 7 June 1960, is changed as follows:

Note. The parenthetical reference to previous changes *(example:* page 1 of C 6) indicates that pertinent material was published in that change.

Page 3, paragraph 1-1 (page 1 of C 6). Make the following changes:

Delete paragraph 1.1 and substitute:

1.1 Indexes of Equipment Publications

a. DA Pam 310-4. Refer to the latest issue of DA Pam 310-4 to determine whether there are new editions, changes, or additional publications pertaining to the equipment.

b. DA Pam 310-7. Refer to the latest issue of DA Pam 310-7 to determine whether there are modification work orders (MWO's) pertaining to the equipment.

Paragraph 2 (as changed by C 7, 27 May 63, and C 8, 12 Nov 64). Delete paragraph 2 and substitute:

2. Forms and Records

a. Reports of Maintenance and Unsatisfactory Equipment. Use equipment forms and records in accordance with instructions given in TM 38-750.

b. Report of Packaging and Handling Deficiencies. Fill out and forward DD Form 6 (Report of Packaging and Handling Deficiencies) as prescribed in AR 700-58 (Army), NAVSUP Publication 378 (Navy), AFR 71-4 (Air Force), and MCO P4610-5 (Marine Corps).

c. Discrepancy in Shipment Report (DISREP) (SF 361). Fill out and forward Discrepancy in Shipment Report (DISREP) (SF 361) as prescribed in AR 55-38 (Army), NAVSUP Publication 459 (Navy), AFM 75-34 (Air Force) and MCO P4610.19 (Marine Corps).

d. Report of Equipment Manual Improvements. Report of errors, omissions, and recommendations for improving this manual by the individual user is encouraged. Reports should be submitted on DA Form 2028 (Recommended Changes to DA Publications) and forwarded direct to Commanding General, U. S. Army Electronics Command, ATTN: AMSEL-ME-NMP-AD, Fort Monmouth, N. J. 07703.

Paragraph 2.1 (as changed by C 7, 27 May 63). Delete paragraph 2.1.

Page 7, paragraph 5*b*. Add the following data to the table:

*This change supersedes C 7, 27 May 1963, and C 8, 12 November 1964.

Quantity	Item	Fig. No.	Height (in.)	Depth (in.)	Width (in.)	Unit weight (lb)
1	Centrifugal Fan HD-390A/U.	6	3 3/16	8 7/8	3 3/16	4
1	Case, Standard Component CY-4868/TRC-68A.	8.1	13 3/8	22 3/8	18 3/8	40

Page 8, paragraph 5*c* (as changed by C 8, 12 Nov 64). Insert the following note after the heading of subparagraph *c.*

Note: On order No. 32626-PC-63, electron tube 6J4 WA has been replaced by electron tube 6J4WB.

Make the following changes in paragraph 5*c*(2):

Line 8, Quantity column: Delete 3 and substitute: 4.

Line 9, Quantity column: Delete 3 and substitute: 1.

Line 10, Quantity column: Delete 5 and substitute: 3.

Last line, Quantity column: Delete 5 and substitute: 3.

Add the following to the chart:

Quantity column: 1; Item column: Cover, dust.

Page 11. Add figure 8.1 after figure 8:

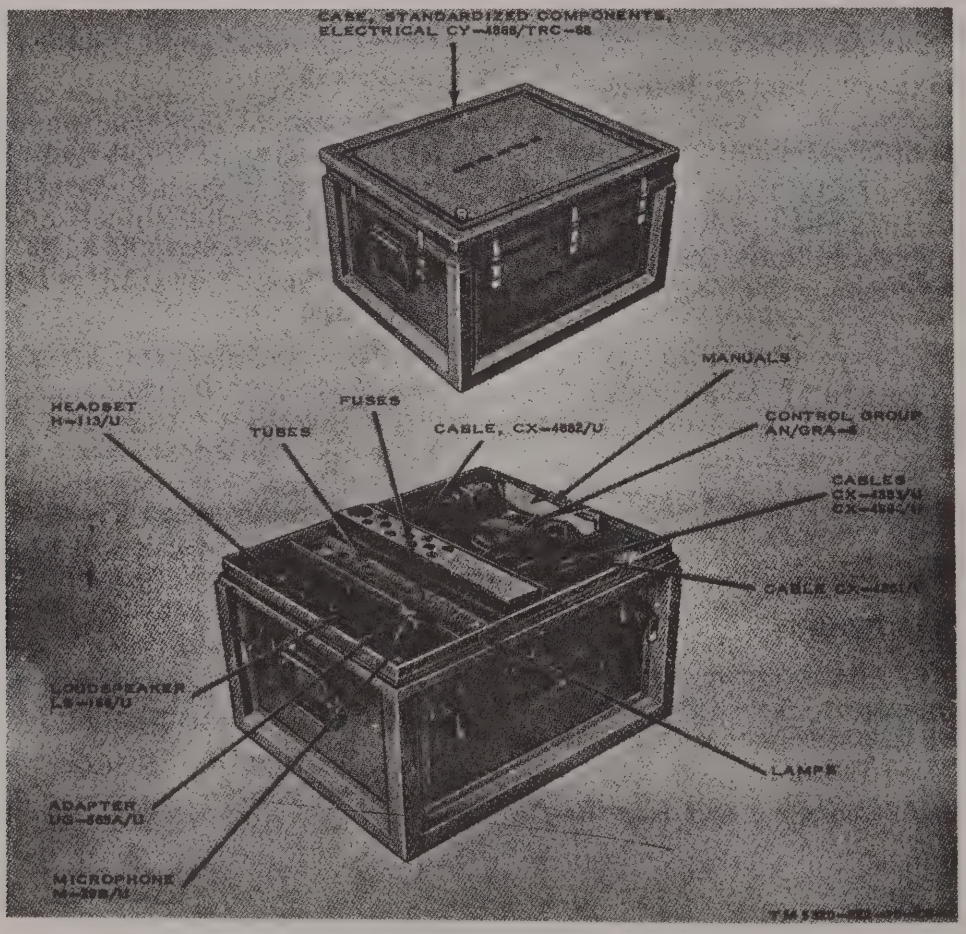

Figure 8.1 Case, Standard Components CY-4868/TRC-68A.

Page 13. Add paragraph 16.1 after paragraph 16.

16.1 Case, Standard Components CY-486-8/TRC-68A

Case, Standard Components CY-486-8/TRC-68A (fig. 8.1) contains separate stowage compartments for the following accessory equipment supplied with the AN/TRC-68A:

a. Cable Assembly CX-4881/U.
b. Cable Assembly CX-4882/U.
c. Cable Assembly CX-4883/U.
d. Cable Assembly XC-4884/U.
e. Connector Adapter UG-565A/U.
f. Control Group AN/GRA-6.
g. Loudspeaker, Dynamic LS-166/U.
h. Headset H-113/U.
i. Headset Cord CX-1334/U.
j. Microphone M-29B/U.
k. Technical manuals.
i. Running spare items.

Page 15, paragraph 18.1 (page 1 of C 4). Delete paragraph 18.1 and substitute:

18.1 Differences in Models

The following chart shows differences in the radio sets listed below.

Item	*Radio Set AN/VRC-24*	*Radio Set AN/VRC-24A*	*Radio Set AN/TRC-68*	*Radio Set AN/TRC-68A*
Case, Standard Components CY-4868/TRC-68A.	.....	.....	.....	X
Case, Accessories CY-2713/TRC-68.....	.....	.....	X	
Loudspeaker, Dynamic LS-166/U.....	X	X	X	(See footnote[a])
Cable, Telephone (WD-1); 1,320 feet per Signal Reel DR-8.	.....	.....	X	
Fans, Centrifugal HD-390/U and HD-390A/U	.....	.....	X	X

[a]Part of CY-4868/TRC-68A.

Page 17, section I (as changed by C 8, 12 Nov 64). Insert the following caution below the note:

CAUTION: When operating the CHANNEL selector switch, allow a minimum of 10 seconds between channel reselections.

Page 27, appendix I (as changed by C 7, 27 May 63). Delete TM 11-5965-263-12P, TM 11-5965-202-15P, and SIG 7 & 8, AN/GRC-32 and titles.

Add the following:

TM 11-5965-222-15P — Operator, Organizational, Field and Depot Maintenance Repair Parts and Special Tool Lists and Maintenance Allocation Chart: Dynamic Loudspeaker LS-166/U

TM 11-5965-231-15P — Operator, Organizational, Field and Depot Maintenance Repair Parts and Special Tool Lists and Maintenance Allocation Chart: Headset, Electrical H-113/U

Page 27, appendix II (as changed by C 7, 27 May 63) delete and substitute:

APPENDIX II BASIC ISSUE ITEMS

Section I. INTRODUCTION

1. Scope

This appendix lists items comprising an operable equipment and those required for installation, operation, or operator's maintenance for Radio Sets AN/VRC-24, AN/TRC-68, AN/VRC-24A, and AN/TRC-68A.

2. Explanation of Columns

The following is a list of explanations of columns in section II.

a. Source, Maintenance, and Recoverability Codes (SMR) Column.

(1) *Source code (S).* The selection status and source for the listed item is the first code indicated in this column. The source codes used and their explanation are —

Code	*Explanation*
P—	Applies to repair parts that are stocked in or supplied from GSA/DSA, or Army supply system, and authorized for use at indicated maintecategories.
A—	Applies to assemblies that are not procured or stocked as such but are made up of two or more units, each of which carries an individual stock number and description and is procured and stocked and can be assembled by units at indicated maintenance categories.

(2) *Maintenance code (M).* The lowest category of maintenance authorized to install the item is indicated by the second code in the column. The maintenance category codes and their explanations are —

Code	*Explanation*
C	Operator/crew
O	Organizational Maintenance

(2) *Recoverability code (R).* The recoverability code is the third code in the column. It indicates whether unserviceable items should be returned for recovery or salvage. Recoverability code and its explanation is as follows:

Note. When no code is indicated in the recoverability column, the part will be considered expendable.

Code	*Explanation*
R—	Applies to repair parts and assemblies that are economically repairable at DSU and GSU activities and are normally furnished by supply on an exchange basis.

b. Federal Stock Number Column. This column indicates the Federal stock number for the item.

c. Description Column This column includes the Federal item name and any additional description of the item which may be required. A part number or other reference number is followed by the applicable five-digit Federal supply code for manufacturers. When required to indicate that the part is used on the models so identified, the numbers 1, 2, 3, and 4 are placed under the heading *Usable on Code.* An explanation of the codes used precedes the first item in section II of the basic issue items list.

d. Unit of Measure Column. The unit used as a basis of measure (e.g., ea, pr, ft, yd, etc.) is given in this column.

e. Quantity Incorporated in Unit Column. The total quantity of the item used in the equipment is given in this column.

f. Quantity Furnished With Equipment, Column. This column lists the quantity of the item supplied for initial operation of the equipment and/or the quantities authorized to be kept on hand by the operator for maintenance of the equipment.

g. Illustrations Column.

(1) *Figure number (a).* The number of the illustration on which the item is shown is indicated in this column.

(2) *Item No. or reference designation (b).* Not used.

3. Federal Supply Codes

This paragraph lists the Federal supply code with the associated manufacturer's name.

Code	*Manufacturer*
24455	General Electric Co., Lamp Division of Consumer Products Group
71400	Bussman Mfg., Division of McGraw-Edison Co.
80063	Army Electronics Command
81349	Military Specifications
96906	Military Standards
98738	Stewart-Warner, Electronics Division of Stewart-Warner Corp.

SECTION II BASIC ISSUE ITEMS

(1) SMR CODE	(2) FEDERAL STOCK NUMBER	(3) DESCRIPTION Reference Number & Mfr Code	USABLE ON CODE	(4) UNIT OF MEAS	(5) QTY INC IN UNIT	(6) QTY FURN WITH EQUIP	(7) ILLUSTRATIONS (a) FIG. NO.	(7) ILLUSTRATIONS (b) ITEM NO. OR REFERENCE DESIGNATION
A-C-R	5820-543-1977	RADIO SET AN/VRC-24: (This item is nonexpendable)					1	
A-C-R	5820-682-2718	RADIO SET AN/TRC-68: (This item is nonexpendable)		ea			2	
A-C-R	5820-892-3722	RADIO SET AN/VRC-24A: (This item is nonexpendable)		ea			1	
A-C-R	5820-892-3723	RADIO SET AN/TRC-68A: (This item is nonexpendable)		ea			2	
		Note: Usable on code 1 refers to Radio Set AN/VRC-24; 2 refers to Radio Set AN/TRC-68; 3 refers to Radio Set AN/VRC-24A; 4 refers to Radio Set AN/TRC-68A.						
		TECHNICAL MANUAL TM 11-5820-222-10: Requisition through pinpoint account number if assigned; otherwise through nearest Adjutant General facility.		ea	2	2	11	
		For technical manuals the quantity indicates the maximum number of copies authorized for packing (or issue) with the equipment. Where a number of these equipments are concentrated in a small area, the quantity on hand may be reduced to the minimum actual requirements as determined by the commanding officer of the unit						
P-C	5935-500-5977	ADAPTER, CONNECTOR, UG-565A/U:	2,4	ea	1	1	9	
P-C-R		ANTENNA AT-197/GR	2,4	ea	1	1	2	
P-C-R	5820-543-1984	ANTENNA AT-803/VR	1,3	ea	1	1	1	
A-C-R	5995-577-8414	CABLE ASSEMBLY, POWER, ELECTRICAL CX-4629/U: (8 ft 0 in) SM-C-345250F; 80063	1,3	ea	1	1	1	
A-C-R	5995-682-3426	CABLE ASSEMBLY, POWER, ELECTRICAL CX-4881/U: (25 ft. 5 in.) SM-C-345266C; 80063	2,4	ea	1	1	2	
A-C-R	5995-577-8415	CABLE ASSEMBLY RADIOFREQUENCY CG-1650/U: (6 ft. 0 in.) SM-C-345252B; 80063	1,3	ea	1	1	1	
A-C-R	5995-682-3402	CABLE ASSEMBLY, SPECIAL PURPOSE, ELECTRICAL CX-4882/U: (20 ft. 6 in.) SM-D-345263E; 80063	2,4	ea	1	1	2	
A-C-R	5995-682-3404	CABLE ASSEMBLY, SPECIAL PURPOSE, ELECTRICAL CX-4883/U: (3 ft. 0 in.) SM-D-345268E; 80063	2,4	ea	1	1	2	
A-C-R	5995-682-3405	CABLE ASSEMBLY, SPECIAL PURPOSE, ELECTRICAL CX-4884/U: (3 ft. 0 in.) SM-D-345254G; 80063	1,2,3,4	ea	1	1	1,2	
A-C-R	5820-999-2627	CASE, ACCESSORIES CY-2713/TRC-68: SC-DL-345283A; 80063	2	ea	1	1	2,8	
A-O-R	5820-999-2627	CASE, STANDARD COMPONENTS CY-4868/TRC-68A:	4	ea	1	1		
A-O-R	5820-644-4554	CONTROL GROUP AN/GRA-6	2,4	ea	1	1	12	
A-C-R	5820-543-1979	CONTROL, RADIO SET C-1439/U	1,2,3,4	ea	1	1	1,2	
P-C	5820-778-0107	COVER, RECEIVER TRANSMITTER, CANVAS DUCK	2,4	ea	1	1		
P-C	5820-752-5982	COVER, RECEIVER TRANSMITTER, CANVAS DUCK: (labeled RT-441/TRC-68)	2	ea	1	1		
P-C	5820-973-0510	COVER, RECEIVER TRANSMITTER: D-434927; 98738	4	ea	1	1		
P-C	5920-043-2641	FUSE CARTRIDGE: F02A250-1/4A; 96906	1,2,3,4	ea	2	3	10	
P-C	5920-281-0224	FUSE CARTRIDGE: F02A250V-1/2A; 96906	1,2,3,4	ea	1	4	10	
P-C		FUSE CARTRIDGE: F02B125V3A; 96906	2,4	ea	2	3	10	
P-C	5920-755-3656	FUSE CARTRIDGE: F03B32V30A; 96906	2,4	ea	1	4	10	
P-C	5920-280-5066	FUSE CARTRIDGE: MDX-5; 71400	2 4	ea ea	1 1	4 2	10	
P-C	5920-057-2986	FUSE CARTRIDGE: MDL15; 71400	1,3	ea	1	4	10	
P-C	5920-199-9502	FUSE CARTRIDGE: ABC-15; 71400	1,3	ea	1	4	10	
P-C	5920-284-6796	FUSE CARTRIDGE: F03G5R0B; 81349	1,3 2,4	ea ea	1 3	1 1		
P-C	5920-503-2203	FUSE CARTRIDGE: F02B250V1/8A; 96906	2,4	ea	5	2		
P-C	5920-504-8633	FUSE CARTRIDGE: F03A32V15A; 81349	2,4	ea	3	1		
P-C-	5920-280-9328	FUSE CARTRIDGE: F02B125V1 1/2A; 81349	2,4	ea	5	2		

SECTION II BASIC ISSUE ITEMS (CONTINUED)

(1) SMR CODE	(2) FEDERAL STOCK NUMBER	(3) DESCRIPTION Reference Number & Mfr Code	USABLE ON CODE	(4) UNIT OF MEAS	(5) QTY INC IN UNIT	(6) QTY FURN WITH EQUIP	(7) ILLUSTRATIONS (a) FIG. NO.	(7) ILLUSTRATIONS (b) ITEM NO. OR REFERENCE DESIGNATION
P-C	5920-755-3235	FUSE CARTRIDGE: FO2B250V3/4A; 81349	2,4	ea	5	2		
P-C	5995-264-7839	HEADSET CORD CX-1334/U:	1,2,3,4	ea	1	1	9	
A-C-R	5965-504-6370	HEADSET, ELECTRIC H-113/U	1,2,3,4	ea	1	1	4,9	
P-C	6240-155-7836	LAMP, INCANDESCENT: 327; 24455	1,2,3	ea	3	7	10	
P-C-R	5820-026-8849	MAST ASSEMBLY AB-282/GRC	2	ea	1	1		
A-C-R	5965-243-6420	LOUDSPEAKER LS-166/U	1,2,3	ea	1	1	11	
A-C-R	5965-892-0722	MICROPHONE M-29B/U	1,2,3,4	ea	1	1	11	
A-C-R	5820-775-0386	MOUNTING MT-2297/TRC-68	2,4	ea	1	1	2	
A-C-R	5820-752-0548	RECEIVER TRANSMITTER GROUP OA-2648/VRC-24	1	ea	1	1	1	
A-C-R	5820-892-3720	RECEIVER TRANSMITTER OA-2648A/VRC-24A	3	ea	1	1	1	
A-C-R	5820-752-0549	RECEIVER TRANSMITTER GROUP OA-2649/TRC-68	2	ea	1	1	2	
A-C-R	5820-892-3721	RECEIVER TRANSMITTER OA-2649A/TRC-68A	4	ea	1	1	2	
P-C	6145-226-8812	CABLE, TELEPHONE (WD-1); 1320 feet per signal reel DR-8	2	ea	1	1	4,9	
A-C-R	5820-995-9430	CASE, RECEIVER TRANSMITTER CY-2557/VRC-24, CY-2557A/VRC-24A	1,3	ea	1	1	5	
A-C-R	5820-681-9916	CASE, RECEIVER TRANSMITTER CY-2712/TRC-68, CY-2712/TRC-68A	2,4	ea	1	1	6	
A-C-R	5820-973-2568	CONVERSION KIT ASSEMBLY: SM-B-355102A; 80063	2,4	ea	1	1		
A-C-R	6125-577-8417	DYNAMOTOR DY-151/U: SC-DL-344929; 80063	1,3	ea	1	1	5	
A-C-R	4140-805-0666	FAN, CENTRIFUGAL HD-390/U; HD-390A/U	2,4	ea	1	1	6	
A-C-R	5820-679-3434	MOUNT MT-1436/U; MT-1436A/U: SC-DL-344948; 80063	1,3	ea	1	1	7	
A-C-R	5820-682-3399	POWER SUPPLY PP-1494/U: SC-DL-345194A; 80063	2,4	ea	1	1	6	
A-C-R	5820-543-1978	RECEIVER TRANSMITTER RT-323/VRC-24	1	ea	1	1	5	
A-C-R	5820-892-3724	RECEIVER TRANSMITTER RT-323A/VRC-24 SC-DL-343840F; 80063	3	ea	1	1	5	
A-C-R	5820-681-9917	RECEIVER TRANSMITTER RT-441/TRC-68	2	ea	1	1	6	
A-C-R	5820-892-3725	RECEIVER TRANSMITTER RT-441A/TRC-68	4	ea	1	1	6	
P-C	5960-262-1357	TUBE, ELECTRON 5654/6AK5W; 81349	4	ea	3	1		
P-C	5960-188-6584	TUBE, ELECTRON 5670; 81349	4	ea	2	1		
P-C	5960-188-3915	TUBE, ELECTRON 5763; 81349	4	ea	2	1		
P-C	5960-995-9177	TUBE, ELECTRON 6J4WB; 81349	4	ea	2	1		
P-C	5960-617-3541	TUBE, ELECTRON 6442; 81349	4	ea	1	1		
P-C	5960-840-5465	TUBE. ELECTRON 7554; 81349	4	ea	1	1		
P-C	5960-840-1055	TUBE, ELECTRON 7609; 81349	4	ea	1	1		
		NO ACCESSORIES, TOOLS, OR TEST EQUIPMENT ARE TO BE ISSUED WITH THIS EQUIPMENT						
		NO BASIC ISSUE ITEMS ARE MOUNTED IN OR ON THIS EQUIPMENT						

By Order of the Secretary of the Army:

W. C. WESTMORELAND,
General, United States Army,
Chief of Staff.

Official:

KENNETH G. WICKHAM,
Major General, United States Army,
The Adjutant General.

Distribution:

To be distributed in accordance with DA Form 12-51 requirements for operator maintenance literature for the AN/VRC-24 and AN/TRC-68 radio sets.

GPO 806—812

Operator's Manual

RADIO SETS AN/VRC-24, AN/VRC-24A, AN/TRC-68, AN/TRC-68A

TM 11-5820-222-10
TO 31R2-2TRC68-1
CHANGES No. 4

DEPARTMENTS OF THE ARMY
AND THE AIR FORCE
WASHINGTON 25, D.C., *29 October 1962*

TM 11-5820-222-10/TO 31R2-2TRC68-1, 7 June 1960, is changed as indicated so that the manual also applies to the following equipment:

Nomenclature	*Order No.*	*Serial No.*
Radio Set AN/VRC-24A	4295-PP-61	1 through 527
Radio Set AN/TRC-68A	4295-PP-61	1 through 129

The title is changed to read as shown above.

Page 3, chapter 1. Below the title add:

Note. Radio Sets AN/VRC-24A and AN/TRC-68A are similar to Radio Sets AN/VRC-24 and AN/TRC-68. Information in this manual also applies to the A models unless otherwise specified.

Paragraph 1. Designate the present text as *a* and add the following:

b. Official nomenclature followed by (*) is used to indicate all models of the equipment covered in this manual. Thus, Radio Set AN/VRC-24(*) represents Radio Set AN/VRC-24 and AN/VRC-24A. Radio Set AN/TRC-68(*) represents Radio Set AN/TRC-68 and AN/VRC-68A. Receiver-Transmitter Group OA-2648(*)/VRC-24 represents Receiver-Transmitter Group OA-2648/VRC-24 and OA-2648A/VRC-24. Receiver-Transmitter Group OA-2649(*)/TRC-68 represents Receiver-Transmitter Group OA-2649/TRC-68 and OA-2649A/TRC-68. Receiver-Transmitter RT-323(*)/VRC-24 represents Receiver-Transmitter RT-323/VRC-24 and RT-323A/VRC-24. Receiver-Transmitter RT-441(*)/TRC-68 represents Receiver-Transmitter RT-441/TRC-68 and RT-441A/TRC-68.

Page 8, paragraph 5*c*. Make the following changes:

Subparagraph (1), chart, "Item" column, line 5. Change "4X150D" to **4X150D[a]**.

Add the following footnote beneath the chart:

[a] On Order No. 19275-PC-60, serial numbers 41 and above and on the AN/VRC-24A, electron tube 7609 is included in place of electron tube 4X150D.

Subparagraph (2), chart, "Item" column, line 5. Change "4X150D" to **4X150D[a]**.

Add the following footnote beneath the chart:

[a] On Order No. 19275-PC-60, serial numbers 41 and above and on the AN/TRC-68A, electron tube 7609 is included in place of electron tube 4X150D.

Page 9, paragraph 9. After the last sentence add: Two air valves are mounted on the rear of the case for relief of internal pressure during air transportation.

Page 13, figure 10. Add the following note to figure 10:

Note. On order No. 19275-PC-60, serial numbers 41 and above and on the A models, electron tube 7609 is included in place of the 4X150D.

Page 15, after paragraph 18, add:

18.1. Differences in Models

Radio Sets AN/VRC-24A and AN/TRC-68A differ from earlier models in the following details:

a. The BROAD BAND receptacle is a 10-pin connector.

b. A dummy connector, with internal jumper, is attached by a chain near the BROAD BAND receptacle; it must be connected thereto for normal operation when security equipment is not connected to the receptacle.

Page 18, section II. Change the word "Note" to **Notes.**

Number the existing note "1" and add the following:

2. Be sure that the chained connector at the BROAD BAND receptacle is connected to the receptacle for normal operation when security equipment is not connected to the receptacle.

Page 91, figure 14. Add the following note to figure 14:

Note. The broad band receptacle is capped with a dummy connector on the A models.

Page 23, paragraph 30*a*(2). Add the following after subparagraph (2):

(3) Dummy connector loose or disconnected from BROAD BAND receptacle on A models .

By Order of the Secretaries of the Army and the Air Force:

EARLE G. WHEELER,
General, United States Army,
Chief of Staff.

Official:
J. C. LAMBERT,
Major General, United States Army,
The Adjutant General.

CURTIS E. LEMAY,
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Corps (2)
USA Tng Cen (2)
USA Msl Comd (3)
USMA (5)
Pine Bluff Cml Arsenal (5)
Svc Colleges (2)
Br Svc Sch (2)
Gen Dep (OS) (2)
Sig Sec, Gen Dep (OS) (5)
A Dep (2) except Lexington (12)
Tobyhanna (12) Sacramento (17)
WRAMC (1)
USA Trans Tml Comd (1)
Army Tml (1)
POE (1)
OSA (1)
USAEPG (2)
AFIP (1)
AMS (1)
Army Pictorial Cen (2)
USA Mobility Spt Cen (1)
Yuma Test Station (2)
USASSA (25)
USASSAMRO (1)
USA Carib Sig Agcy (1)
USA Sig Msl Spt Agcy (13)
Sig Fld Maint Shops (3)
USA Corps (3)
JBUSMC (2)
USA Strat Comm Comd (4)
Units org under fol TOE:
(2 each UNOINDC)
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1–78
1–107

1–123
1–137
5–45
5–46
6–100
6–101
6–200
6–201
6–300
6–301
6–302
6–401
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7–2
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7–12
7–15
7–16
7–25
7–26
7–35
7–36
7–42
7–45
7–46
8–137
9–47
9–87
9–227
9–377
9–500 AA–AC
11–5
11–7
11–16
11–37
11–55
11–57
11–95
11–96
11–97
11–98
11–99
11–117
11–155
11–157
11–500 AA–AE (4)
11–555
11–557
11–587
11–592
11–597
17
17–2
17–22
17–25
17–26
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17–36
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44–544
44–545
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44–548
55–57
57
57–5
57–42

NG: State AG (3)—units same as active Army except allowance is one copy to each unit.

USAR: None.

For explanation of abbreviations used, see AR 320–50.

U.S. GOVERNMENT PRINTING OFFICE: 1970—816-413/46
827-981

CHANGE
No. 10

HEADQUARTERS
DEPARTMENT OF THE ARMY
WASHINGTON, D.C., *3 December 1973*

Operator's Manual

RADIO SETS AN/VRC-24, AN/VRC-24A, AN/TRC-68 AND AN/TRC-68A

TM 11-5820-222-10/TO 31R2-2TRC68-1, 7 June 1960, is changed as follows:

Page 3, paragraph 2. Delete paragraph 2 and substitute new paragraph 2.

2. Forms and Records

a. Reports of Maintenance and Unsatisfactory Equipment. Maintenance forms, records, and reports which are to be used by maintenance personnel at all maintenance levels are listed in and prescribed by TM 38-750.

b. Report of Packaging and Handling Deficiencies. Fill out and forward DD Form 6 (Report of Packaging and Handling Deficiencies) as prescribed in AR 700-58 (Army)/NAVSUP PUB 378 (Navy)/AFR 71-4 (Air Force)/and MCO P4030.29 (Marine Corps).

c. Discrepancy in Shipment Report (DISREP) (SF 361). Fill out and forward Discrepancy in Shipment Report (DISREP) (SF 361) as prescribed in AR 55-38 (Army)/NAVSUP PUB 459 (Navy)/AFM 75-34 (Air Force)/and MCO P4610.19 (Marine Corps).

Add paragraph 2.1 after paragraph 2.

2.1. Reporting of Equipment Publication Improvements

The reporting of errors, omissions, and recommendations for improving this publication by the individual user is encouraged. Reports should be submitted on DA Form 2028 (Recommended Changes to Publications) and forwarded direct to Commander, US Army Electronics Command, ATTN: AMSEL-MA-C, Fort Monmouth, NJ 07703.

Page 7, paragraph 5. Change the title of paragraph 5 to "Components and Dimensions."

Delete subparagraph *c.*

After paragraph 5 add paragraph 5.1.

5.1. Items Comprising Operable Radio Sets AN/VRC-24 (FSN 5820-543-1977), AN/VRC-24A (FSN 5820-892-3722), AN/TRC-68 (FSN 5820-682-2718), and AN/TRC-68A (FSN 5820-892-3723)

FSN	*Qty*	*Nomenclature, part No., and mfr code*	*Usable on code*

NOTE

The part number is followed by the applicable 5-digit Federal supply code for manufacturers (FSCM) identified in SB 708-42 and used to identify manufacturer, distributor, or Goverment agency, etc.

NOTE

Number 1 in the usable on code column refers to Radio Set AN/VRC-24; number 2 refers to Radio Set AN/TRC-68; number 3 refers to Radio Set AN/VRC-24A; and number 4 refers to Radio Set AN/TRC-68A.

5935-500-5977	1	Adapter, Connector, UG-565A/U	2,4
	1	Antenna, AT-197/GR	2,4
5820-543-1984	1	Antenna, AT-803/VR	1,3
5995-577-8414	1	Cable Assembly, Power, Electrical, CX-4629/U, 8 ft, SM-C-345250F, 80063	1,3
5995-682-3426	1	Cable Assembly, Power Electrical, CX-4881/U, 25 ft 5 in, SM-C-345266C, 80063	
5995-577-8415	1	Cable Assembly, Radiofrequency, CG-1650/U, 6 ft, SM-C-345252B, 80063	1,3
5995-682-3402	1	Cable Assembly, Special Purpose, Electrical CX-4882/U, 20 ft 6 in., SM-D-345263E, 80063	2,4
5995-682-3404	1	Cable Assembly, Special Purpose, Electrical CX4883/U, 3 ft, SM-D-345268E, 80063	1,3
5995-682-3405	1	Cable Assembly, Special Purpose, Electrical CX4884/U, 3 ft, SM-D-345254G, 80063	1,2,3,4
5820-644-4554	1	Control Group, AN-GRA-6	2,4
5820-543-1979	1	Control, Radio Set, C-1439/U	1,2,3,4
5995-264-7839	1	Headset Cord CX-1334/U	1,2,3,4
5965-504-6370	1	Headset, Electric, H-113/U	1,2,3,4
5965-243-6420	1	Loudspeaker, LS-166/U	1,2,3
5820-026-8849	1	Mast Assembly AB-282/GRC	2
5965-892-0722	1	Microphone, M-29B/U	1,2,3,4
5920-775-0386	1	Mounting, MT-2297/TRC-68	2,4
5820-752-0548	1	Receiver Transmitter Group AO-2648/VRC-24	1
5820-892-3720	1	Receiver Transmitter, OA-2648A/VRC-24A	3
5820-752-0549	1	Receiver Transmitter Group, OA-2649/TRC-68	2
5820-892-3721	1	Receiver Transmitter, OA-2649A/TRC-68A	4
6145-226-8812	1	Cable, Telephone, (WD-1), 1320 ft per signal reel, DR-8	2
6125-577-8417	1	Dynamotor, DY-151/U, SC-DL-344929, 80063	1,3
4140-805-0666	1	Fan, Centrifugal, HD-390/U, HD-390A/U	2,4
5820-679-3434	1	Mounting MT-1436/U, SC-DL-344948, 80063	1,3
5820-775-0386	1	Mounting MT-2297/TRC-68	2,4
5820-682-3399	1	Power Supply, PP-1494/U, SC-DL-345194A, 80063	2,4
5820-543-1978	1	Receiver Transmitter, TR-323/VRC-24	1
5820-892-3724	1	Receiver Transmitter, RT-323A/VRC-24, SC-DL-343840F, 80063	3
5820-681-9917	1	Receiver Transmitter, RT-441/TRC-68	2
5820-892-3725	1	Receiver Transmitter, RT-441A/TRC-68	

After paragraph 5.1 add paragraph 5.2.

5.2. Running Spares

FSN	*Qty*	Item	*Usable on code*
5920-043-2641	3	Fuse Cartridge: F02A250-1/4 A; 96906	1,2,3,4
5920-281-0224	4	Fuse Cartridge: F02A250V-1/2 A; 96906	1,2,3,4
	3	Fuse Cartridge: F02B125V3A; 96906	2,4
5920-755-3656	4	Fuse Cartridge: F03B32V30A; 96906	2,4
5920-280-5066	4	Fuse Cartridge: MDX-5; 71400	2
	2		4
5920-057-2986	4	Fuse Cartridge: MDL 15; 71400	1,3
5920-199-9502	4	Fuse Cartridge: ABC-15; 71400	1,3
5920-284-6796	1	Fuse Cartridge: F03G5R0B; 81349	1,2,3,4
5920-503-2203	2	Fuse Cartridge: F02B250V1/8A; 96906	2,4
5920-504-8633	1	Fuse Cartridge: F03A32V15A; 81349	2,4
5920-280-9328	2	Fuse Cartridge: F02B125V1 1/2A; 81349	2,4
5920-755-3235	2	Fuse Cartridge: F02B250V3/4A; 81349	2,4
5960-262-1357	1	Tube, Electron 5654/6AK5W; 81349	4
5960-188-6584	1	Tube, Electron 5670; 81349	4
5960-188-3915	1	Tube, Electron 5763; 81349	4
5960-995-9177	1	Tube, Electron 6F4WB; 81349	4
5960-617-3541	1	Tube, Electron 6442; 81349	4
5960-840-5465	1	Tube Electron 7554; 81349	4
5960-840-1055	1	Tube, Electronic 7609 (See note below); 81349	4

NOTE

On Order No. 19275-PC-60, serial numbers 41 and above; the AN/VRC-24A, and AN/VRC-68A, electron tube 7609 is included in place of electron tube 4X150D.

Page 27, appendix II. Delete appendix II and substitute the following:

APPENDIX II

BASIC ISSUE ITEMS LIST

Section I. INTRODUCTION

1. Scope

This appendix lists basic issue items required by the crew/operator for installation, operation, and maintenance of Radio Sets AN/VRC-24, AN/TRC-68, AN/VRC-24A, and AN/TRC-68A.

2. General

The basic issue items list, as a list, in alphabetical sequence, of items which are furnished with, and which must be turned in with the end item.

3. Explanation of Columns

The following provides an explanation of columns found in the tabular listings:

a. Illustration. This column is divided as follows:

(1) *Figure number.* Indicates the figure number of the illustration in which the item is shown.

(2) *Item number.* Not applicable.

b. Federal Stock Number. Indicates the Federal stock number assigned to the item and will be used for requisitioning purposes.

c. Part Number. Indicates the primary number used by the manufacturer (individual, company, firm, corporation, or Government activity), which controls the design and characteristics of the item by means of its engineering drawings, specifications standards, and inspection requirements, to identify an item or range if items.

d. Federal Supply Code for Manufacturer (FSCM). The FSCM is a 5-digit numeric code used to identify the manufacturer, distributor, or Government agency, etc., and is identified in SB 708-42.

e. Description. Indicates the Federal item name and a minimum description required to identify the item.

f. Unit of Measure (U/M). Indicates the standard of basic quantity of the listed item as used in performing the actual maintenance function. This measure is expressed by a two-character alphabetical abbreviation, (e.g., ea, in., pr, etc.). When the unit of measure differs from the unit of issue, the lowest unit of issue that will satisfy the required units of measure will be requisitioned.

g. Quantity Furnished with Equipment (Basic Issue Items Only). Indicates the quantity of the basic issue item furnished with the equipment.

4. Special Information

Usable on codes are included in Column 5. Uncoded items are applicable to all models. Identification of the usable on codes are as follows:

Code	*Used on*
1	Radio Set AN/VRC-24
2	Radio Set AN/TRC-68
3	Radio Set AN/VRC-24A
4	Radio Set AN/TRC-68A

Section II. BASIC ISSUE ITEMS LIST

(1) Illustration (A) Fig. No.	(1) Illustration (B) Item No.	(2) Federal stock number	(3) Part number	(4) FSCM	(5) Description	Usable on code	(6) Unit of meas	(7) Qty furn with equip
2,8		5820-999-2627	SC-DL-345283A	80063	CASE ACCESSORIES CY-2713/TRC-68		EA	1
		5820-999-2627			CASE, STANDARD COMPONENTS CY-4868/TRC-68A	4	EA	1
		5820-752-0107			COVER, RECEIVER TRANSMITTER CANVAS DUCK	2,4	EA	1
		5820-752-5982			COVER, RECEIVER, TRANSMITTER, CANVAS DUCK, (labeled RT-441/TRC-68)	2	EA	1
		5820-973-0510	D-434927	98738	COVER, RECEIVER TRANSMITTER	4	EA	1
5		5820-995-9430			CASE, RECEIVER TRANSMITTER, CY-2557/VRC-24, CY-2557A/VRC-24A	1,3	EA	1
6		5820-681-9916			CASE, RECEIVER TRANSMITTER CY-2712/TRC-58, CY-2712/TRC-68A	2,4	EA	1
		5820-973-2568	SM-B-355102A	80063	CONVERSION KIT ASSEMBLY	2,4	EA	1

By Order of the Secretary of the Army:

CREIGHTON W. ABRAMS
General, United States Army
Chief of Staff

Official:

VERNE L. BOWERS
Major General, United States Army
The Adjutant General

Distribution:

To be distributed in accordance with DA Form 12-51, Operator's Maintenance requirements for AN/TRC-68 and AN/VRC-24.

* United States Government Printing Office:1981--341-662/9767

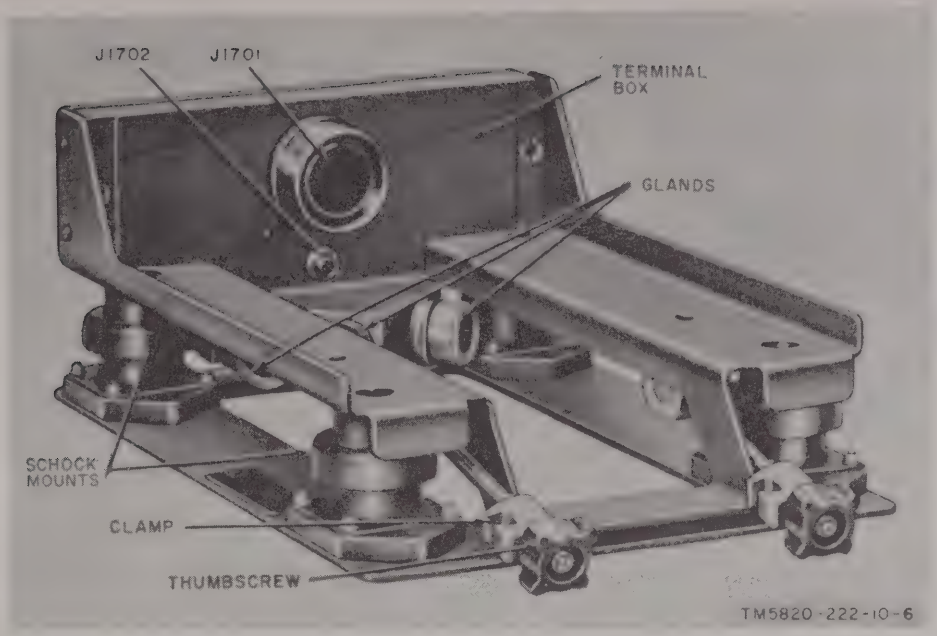

Figure 7. Mounting MT–1436/U.

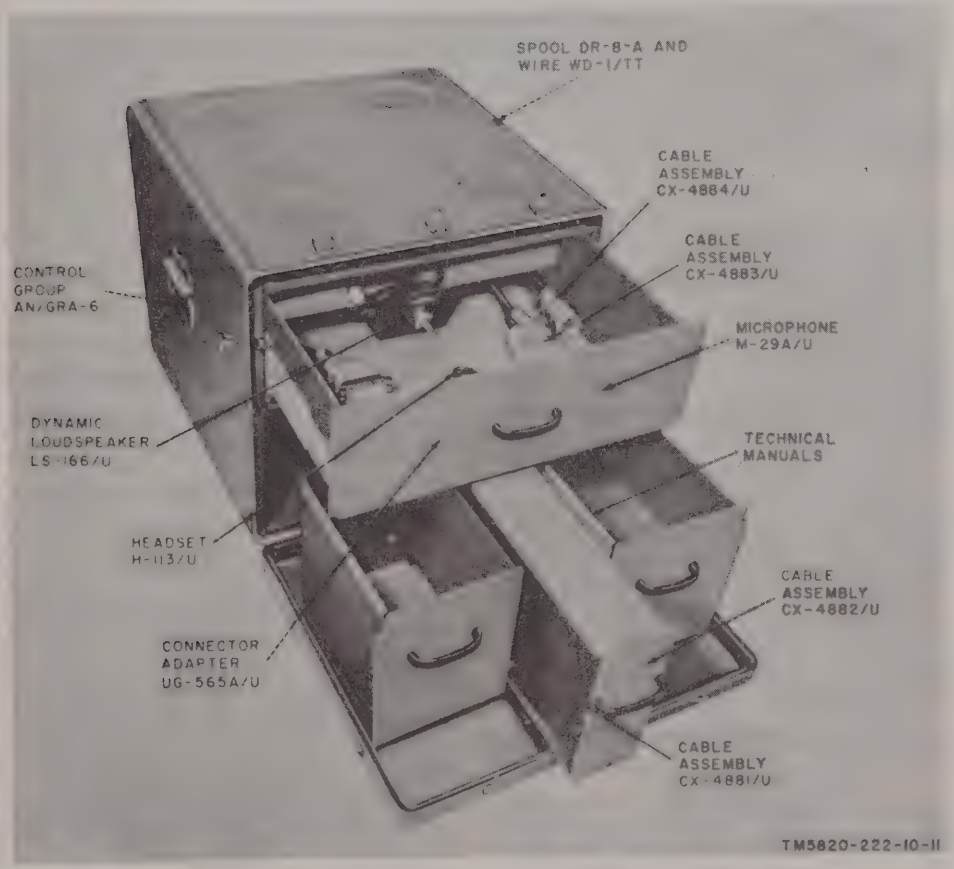

Figure 8. Accessory case.

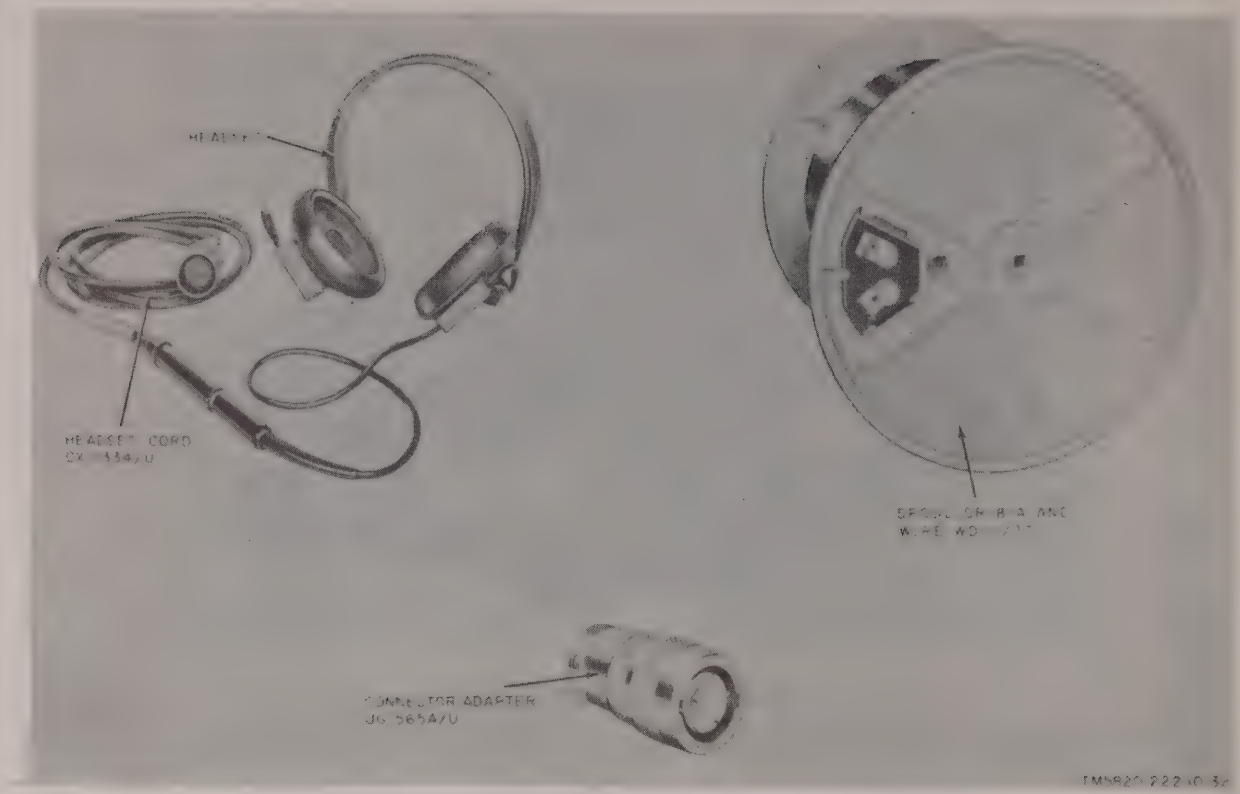

Figure 9. Spool DR–8–A with wire, Connector Adapter UG–565A/U, and headset with cord.

12. Mounting MT–1436/U
(fig. 7)

The mounting consists of two steel platforms separated by four shock mounts. The lower platform is drilled to accommodate bolts for fastening the mounting rigidly to a vehicle. A waterproof terminal box with a removable cover is fastened to the rear of the upper platform. The terminal box contains the receptacles which receive the rear plugs of Receiver-Transmitter Group OA–2648/VRC–24. Two terminal boards in the terminal box are used for connecting the receptacles to the power and interconnecting cables. Three glands provide waterproof entrances for the cables. Clamps at the front of the mounting engage pins in the lower edge of the RT–323/VRC–24 front panel. The thumbscrews which secure the clamps also serve as injector-ejector mechanisms.

13. Antennas

a. Antenna AT–803/VR. Antenna AT–803/VR (fig. 1) is designed for mobile operation. It is used with Receiver-Transmitter Group OA–2648/VRC–24. It is approximately 10 inches long and has a UG–484/U connector at its base for attaching the CG–1650/U.

b. Antenna Assembly AT–197/GR. Antenna Assembly AT–197/GR (fig. 2) is used with Receiver-Transmitter Group OA–2649/TRC–68. It is a disk-cone antenna with two radiator assemblies; the upper part forms a disk, and the lower part forms a cone.

14. Cables for Radio Set AN/VRC–24
(fig. 1)

a. Radio Frequency Cable Assembly CG–1650/U. This is a 6-foot coaxial radiofrequency (rf) cable which connects Antenna AT–803/VR to the ANT connector on the RT–323/VRC–24.

b. Electrical Power Cable Assembly CX–4629/U. This cable is a two-wire 8-foot power cable. Connections on one end are made at the vehicular battery terminals and connections at the other end are made at Mounting MT–1436/U.

c. Electrical Special Purpose Cable Assem-

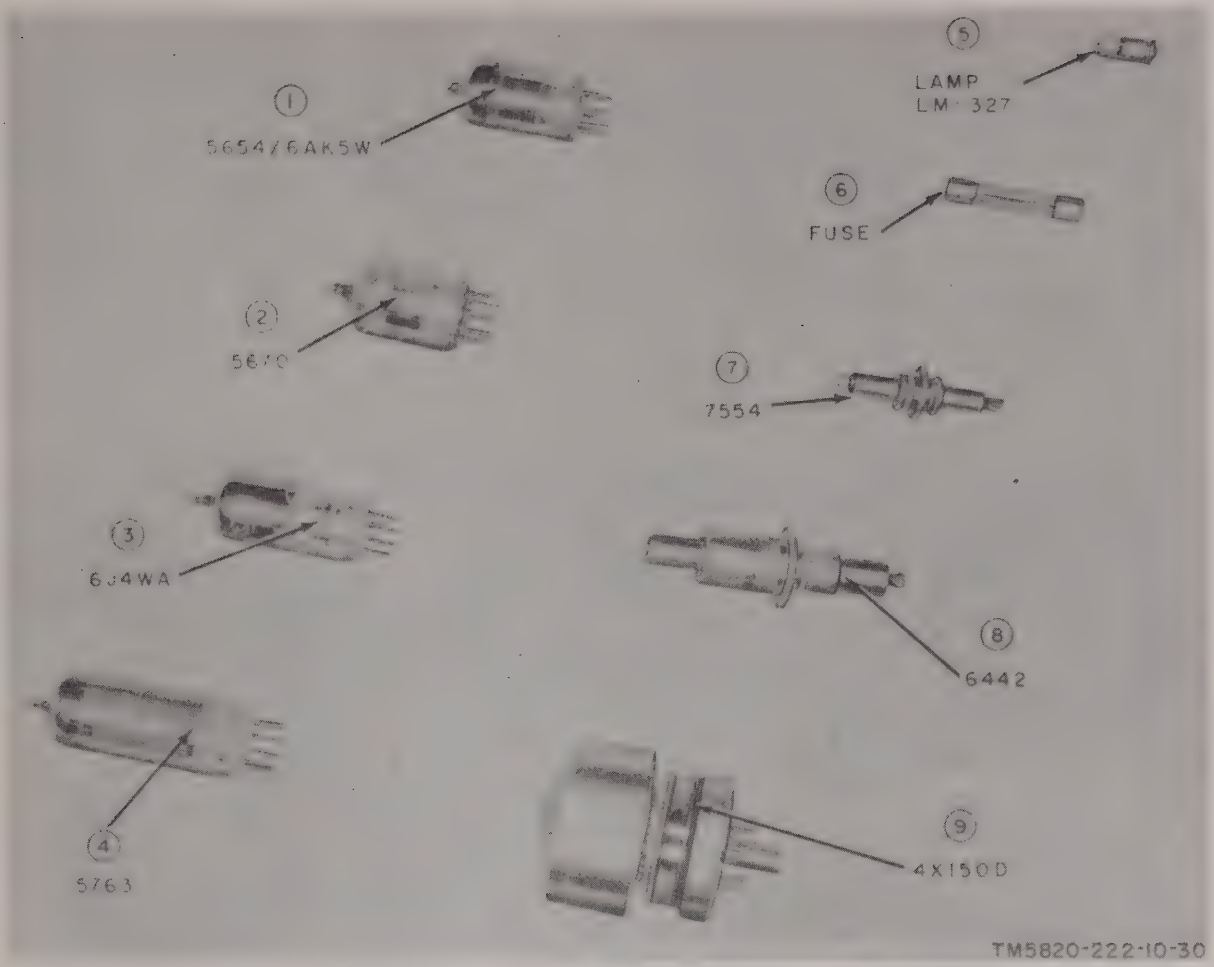

Figure 10. Running spares.

bly CX-4630/U. This is a 10-foot control cable. A 30-contact plug at one end of the cable connects to the radio set control and 22 wires at the other end are soldered to terminal boards in Mounting MT-1436/U.

d. Electrical Special Purpose Cable Assembly CX-4884/U. This is a 3-foot extension cable that permits operation of the RT-323/VRC-24 when removed from its case for maintenance.

15. Cables for Radio Set AN/TRC-68 (fig. 2)

a. Electrical Power Cable Assembly CX-4881/U. This is a 25-foot, 2-conductor power cable. One end plugs into an ac outlet and the other end connects to the AC POWER receptacle at the rear of the AN/TRC-68 case.

b. Electrical Special Purpose Cable Assembly CX-4882/U. This is a 20½-foot control cable. It connects the radio set control to the receiver-transmitter group.

c. Electrical Special Purpose Cable Assembly CX-4883/U. This is a 3-foot extension cable that permits operation of the power supply when removed from the AN/TRC-68 case for maintenance.

d. Electrical Special Purpose Cable Assembly CX-4884/U. This is a 3-foot extension cable that permits operation of the RT-441/TRC-68 when removed from the AN/TRC-68 case for maintenance.

16. Accessory Case CY-2713/TRC-68 (fig. 8)

The accessory case contains four drawers for storing the accessory equipment described in paragraph 18, Spool DR-8-A and Wire WD-1/TT (fig. 9), the interconnecting cables, spare tubes (fig. 10), and technical manuals supplied as part of the AN/TRC-68.

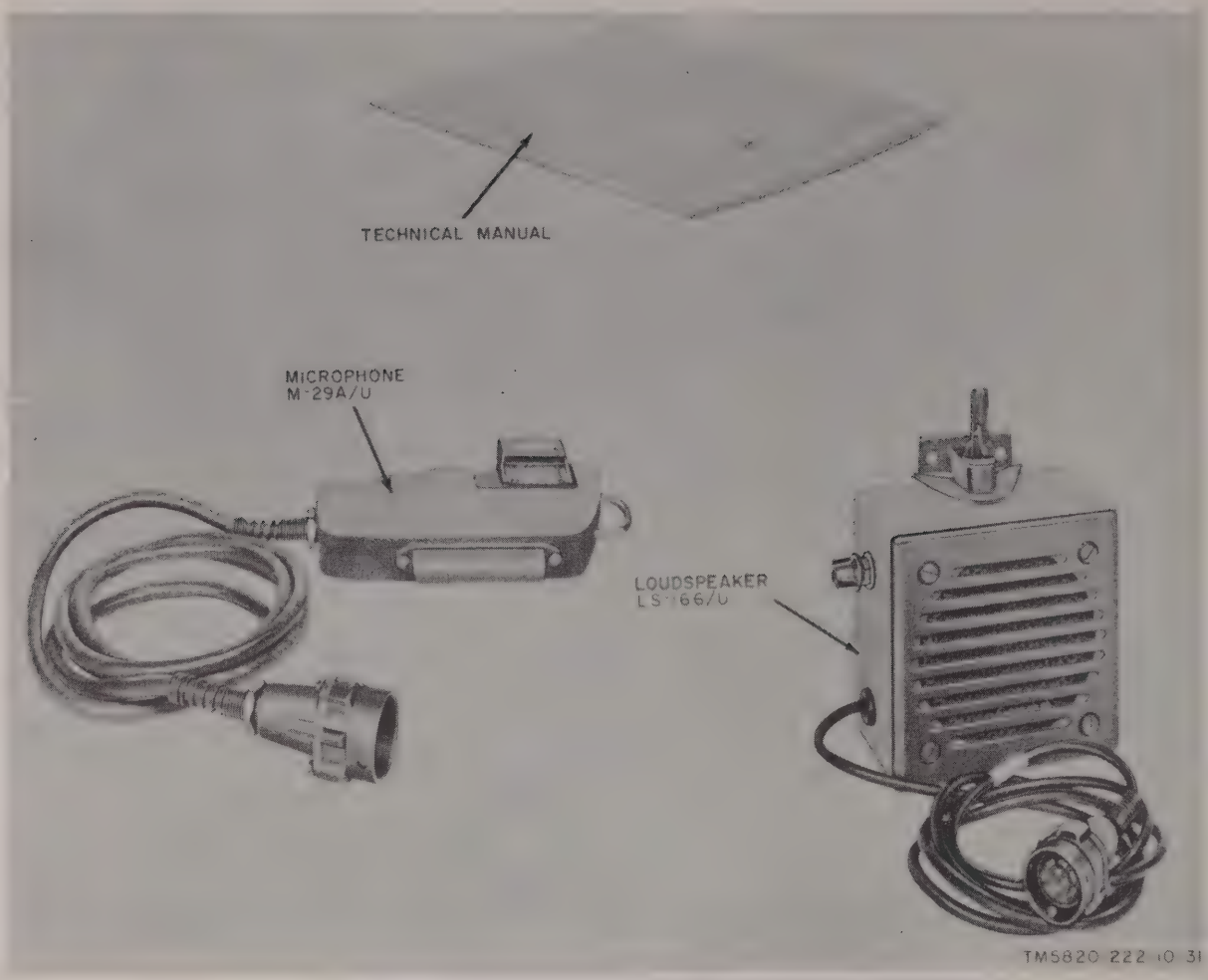

Figure 11. Microphone, technical manual, and loudspeaker.

17. Miscellaneous Components

a. Control Group AN/GRA-6 (fig. 12). The AN/GRA-6 (TM 11-5038) consists of a local and a remote control, a handset, and a carrying bar. The AN/GRA-6 provides push-to-talk control of the AN/TRC-68 from a position up to 2 miles away.

b. Headset and Headset Cord (fig. 9). The headset consists of two series-connected earphones. A 14-inch cord, terminated at the earphones, connects the headset to Headset Cord CX-1334/U. The CX-1334/U is a 5-foot cord which is used to connect the headset to an AUDIO receptacle on the RT-323/VRC-24, RT-441/TRC-68, or radio set control.

c. Loudspeaker (fig. 11). The loudspeaker is a 4-inch unit. A 5-foot cord that terminates in a 10-pin plug is used to connect the loudspeaker to an AUDIO receptacle on the RT-323/VRC-24, RT-441/TRC-68, or radio set control. A universal-type clamp is provided on the speaker case for mounting purposes.

d. Microphone M-29A/U (fig. 11). The microphone element is housed in a plastic case. A push-to-talk switch is located on the side of the case. A connecting cord terminated in a 10-pin plug is used to connect the microphone to an AUDIO receptacle on the RT-323/VRC-24, RT-441/TRC-68, or radio set control.

e. Connector Adapter UG-565A/U (fig. 9). The adapter mates a series C female plug with a series N male plug. It is used to adapt the ANT connector on the RT-441/TRC-68 to the cable from Antenna Assembly AT-197/GR.

f. Mounting MT-2297/TRC-68 (fig. 6). The mounting consists of a single plate upon which the AN/TRC-68 case is mounted and four feet which can be fastened to a mounting surface.

18. Additional Equipment Required

Electrical Special Purpose Cable Assembly CX-4498/U (fig. 3) is not supplied with the AN/VRC-24, but is required when the AN/VRC-24 is to be used as a retransmission device with Radio Sets AN/GRC-3 through -8. Wires at the single end of the cable are wired to terminal boards in the mounting, and the branched ends of the cable connect to the RT-70 POWER and AUDIO receptacles of AF Amplifier AM-65/GRC, part of Radio Sets AN/GRC-3 through -8.

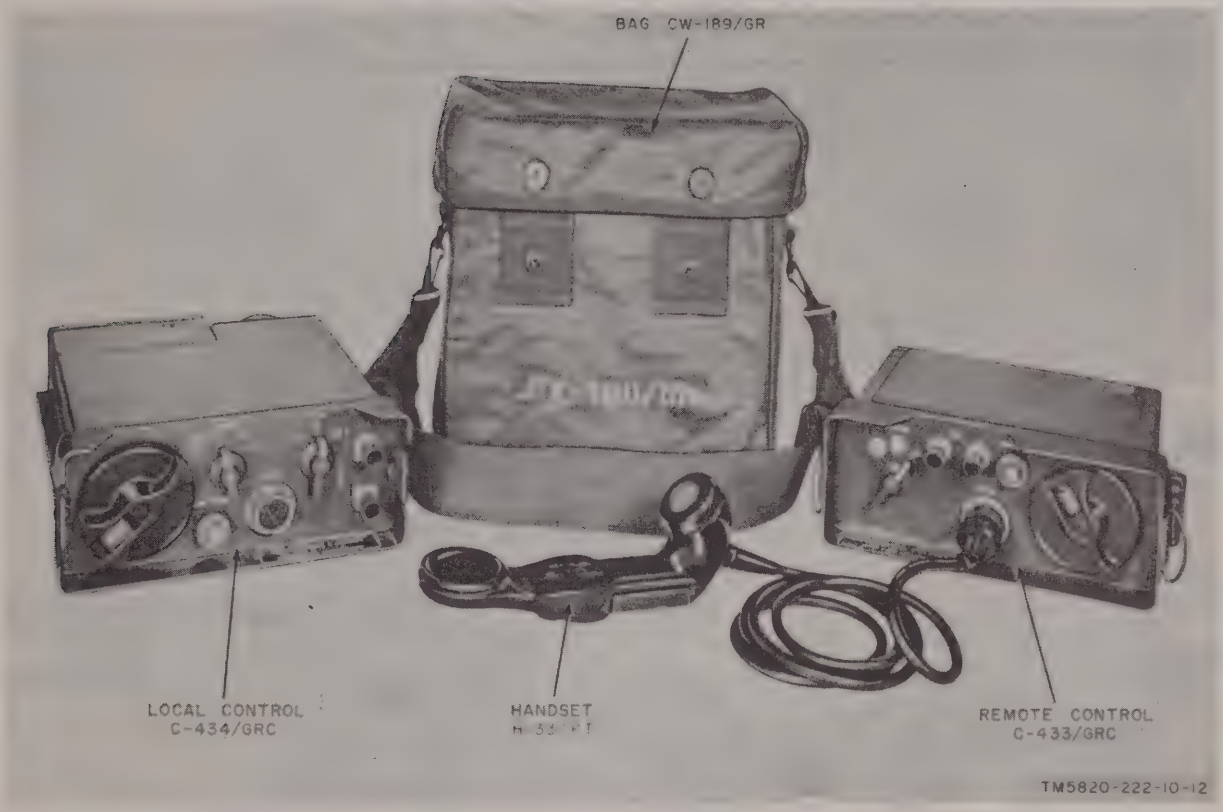

Figure 12. Control Group AN/GRA-6.

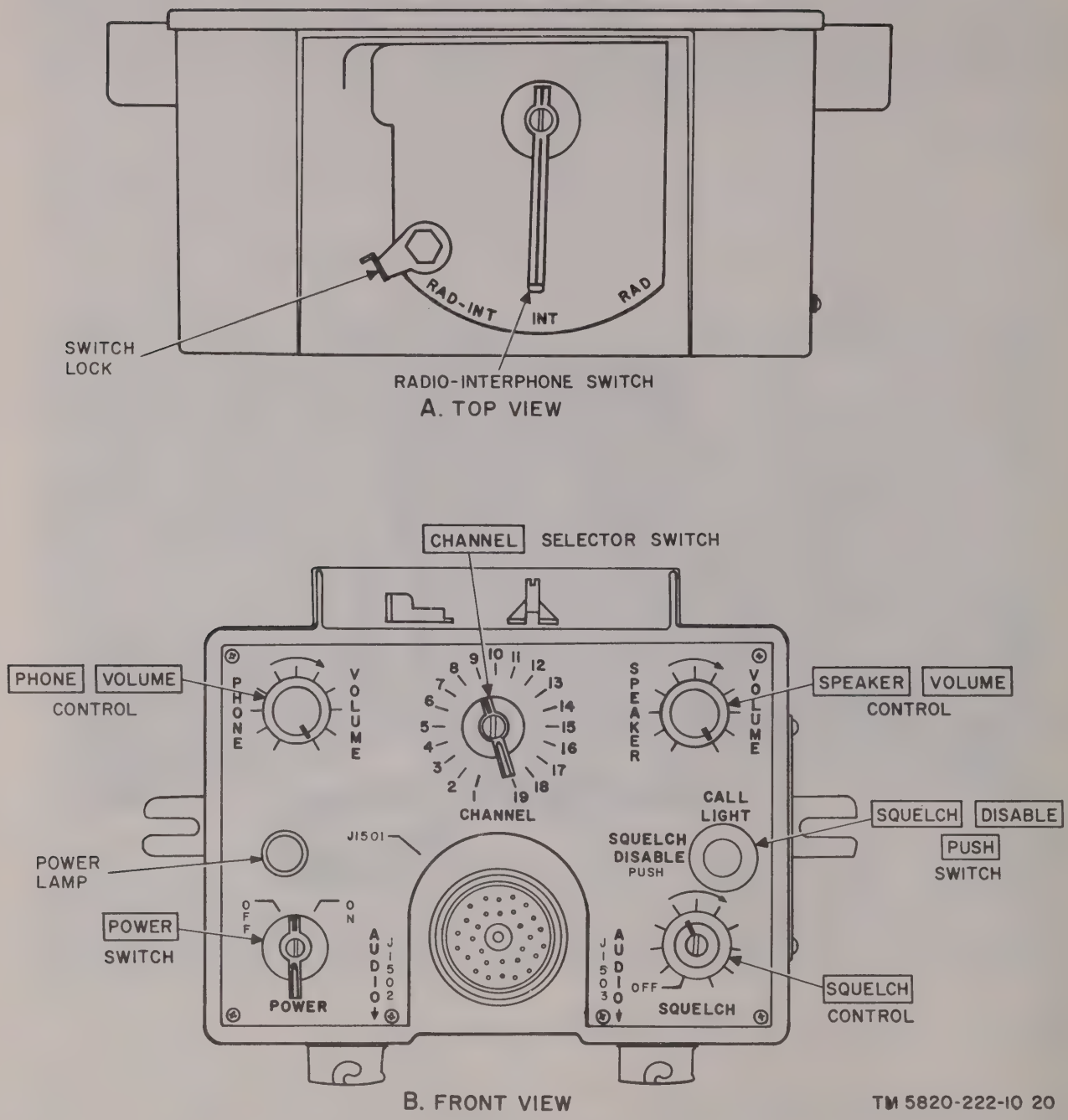

Figure 13. Radio Set Control C–1439/U, controls and indicators.

CHAPTER 2
OPERATING INSTRUCTIONS

Section I. CONTROLS AND INDICATORS

Note. Controls of the AN/GRA–6 supplied with the AN/TRC–68 are covered in TM 11–5038.

19. Radio Set Control C–1439/U (fig. 13)

Control or indicator	Function
POWER switch	Turns the equipment on or off. Switch is spring-loaded to neutral position.
Power lamp	Lights when power is on.
SPEAKER VOLUME control	Controls loudspeaker audio output level.
PHONE VOLUME control	Controls headset audio ouput level.
CHANNEL selector switch	Selects one of 19 preset channels when the CHAN SEL switch on the receiver-transmitter is in the REMOTE PRESET position.
SQUELCH DISABLE-PUSH switch and CALL LIGHT lamp	*Switch* When pushed, disables the squelch circuit. *Lamp* Lights when the SQUELCH control is OFF, when the SQUELCH DISABLE PUSH switch is pushed, or when the signal received is strong enough to deactivate the squelch.
SQUELCH control	Squelch circuit quiets receiver when there is no incoming signal above level determined by SQUELCH control setting. Squelch circuit is inoperative with the control in the OFF position.
Radio-interphone switch (RAD, INT, RAD-INT).	RAD position — Allows the operator to operate (transmit or receive) RT–323/VRC–24 or RT–441/TRC–68 from the radio set control. INT position — Allows operator to communicate over interphone with personnel at interphone positions connected to retransmission equipment. RAD-INT position — Combines the operation of the above two positions. This position is spring-loaded and must be locked in position.

20. Controls and Indicators, RT–323/VRC–24 and RT–441/TRC–68 (fig. 14)

Control or indicator	Function
POWER switch	Turns the equipment on or off. Switch is spring-loaded to neutral position.
CHAN SEL switch	A 21-position switch with functions as follows: *Position* — *Function* REMOTE PRESET — Transfers control of channel selection and squelch operation to radio set control. Positions 1 through 19 — Selects preset channels 1 through 19. MANUAL — Transfers frequency selection control to the MANUAL FREQUENCY switches; TENS, UNITS, TENTHS.
MANUAL FREQUENCY switches:	
TENS	Selects first two digits of frequency in mc.
UNITS	Selects third digit of frequency in mc.
TENTHS	Selects fourth digit of frequency in tenths of an mc. Example: To select 325.6 mc, set TENS switch to 32, UNITS switch to 5, and TENTHS switch to .6.
SQUELCH control	Squelch circuit quiets receiver when there is no incoming signal above level determined by SQUELCH control setting. Squelch circuit is inoperative with the control at OFF.

20. Controls and Indicators—Continued.

Control or indicator	Function
SQUELCH DISABLE-PUSH switch and CALL LIGHT lamp	*Switch* When pushed, disables the squelch circuit. *Lamp* Lights when the SQUELCH control is at OFF, when the SQUELCH DISABLE-PUSH switch is pushed, or when the signal received is strong enough to deactivate the squelch.
VOLUME control	Adjusts the loudspeaker or local headset audio output level.
Meter and METER switch	The meter monitors any one of 10 circuits selected by the METER switch. Indicates whether or not monitored circuit is NORMAL.
	Position — *Function* S-METER — Indicates relative strength of received signal. HIGH B+ — Checks 300-volt supply. LOW B+ — Checks 125-volt supply. LINE V — Checks 26.4-volt supply. % MOD — Checks modulator output. DVR I_b — Checks plate current of driver stage. PA I_g — Checks grid current of power amplifier stage. PA I_b — Checks plate current of power amplifier stage. PWR — Checks power output. SWR — Checks reflected power on transmission line.
AUDIO receptacles	Provide connections for af output (loudspeaker or headset), microphone input, and radio control line connections.
PRESET CHANNEL indicator	Indicates channel on which the set is operating. When CHAN SEL switch is set at MANUAL, M appears in the window.
FREQ indicators	Indicate frequency to which the set is tuned. Numerals in center window indicate tens and units of megacycles and numeral in right window indicates tenths of a megacycle.

21. Power Supply Indicator (fig. 15)

The only indicator on the power supply panel is the POWER lamp. When lighted, it indicates that power supply voltages are available to the RT-441/TRC-68.

Section II. OPERATION

Note. Before the radio set can be operated (by SQUELCH control and CHANNEL selector switch) from the radio set control, the CHAN SEL switch on the RT-323/VRC-24 or RT-441/TRC-68 unit must be set to REMOTE PRESET.

22. Presetting Channels (fig. 16)

Perform the following procedures to preset channels to a desired frequency.

a. Operate the POWER switch momentarily to ON and release.

b. Loosen the four slotted-head screws in the memory drum access door and open the door.

c. In the SET CHAN row, find the number of the channel to be preset.

d. Set the CHAN SEL switch to the number in the SEL PRESET row directly below the number in the SET CHAN row. For example: To preset channel 12, set the CHAN SEL switch to 8; to preset channel 17, set the CHAN SEL switch to 13. In figure 16, the CHAN SEL switch is set to MANUAL to preset channel 4.

e. Slide the four pins on the memory drum in the slots for the channel being preset. Set each pin to a position above the number on

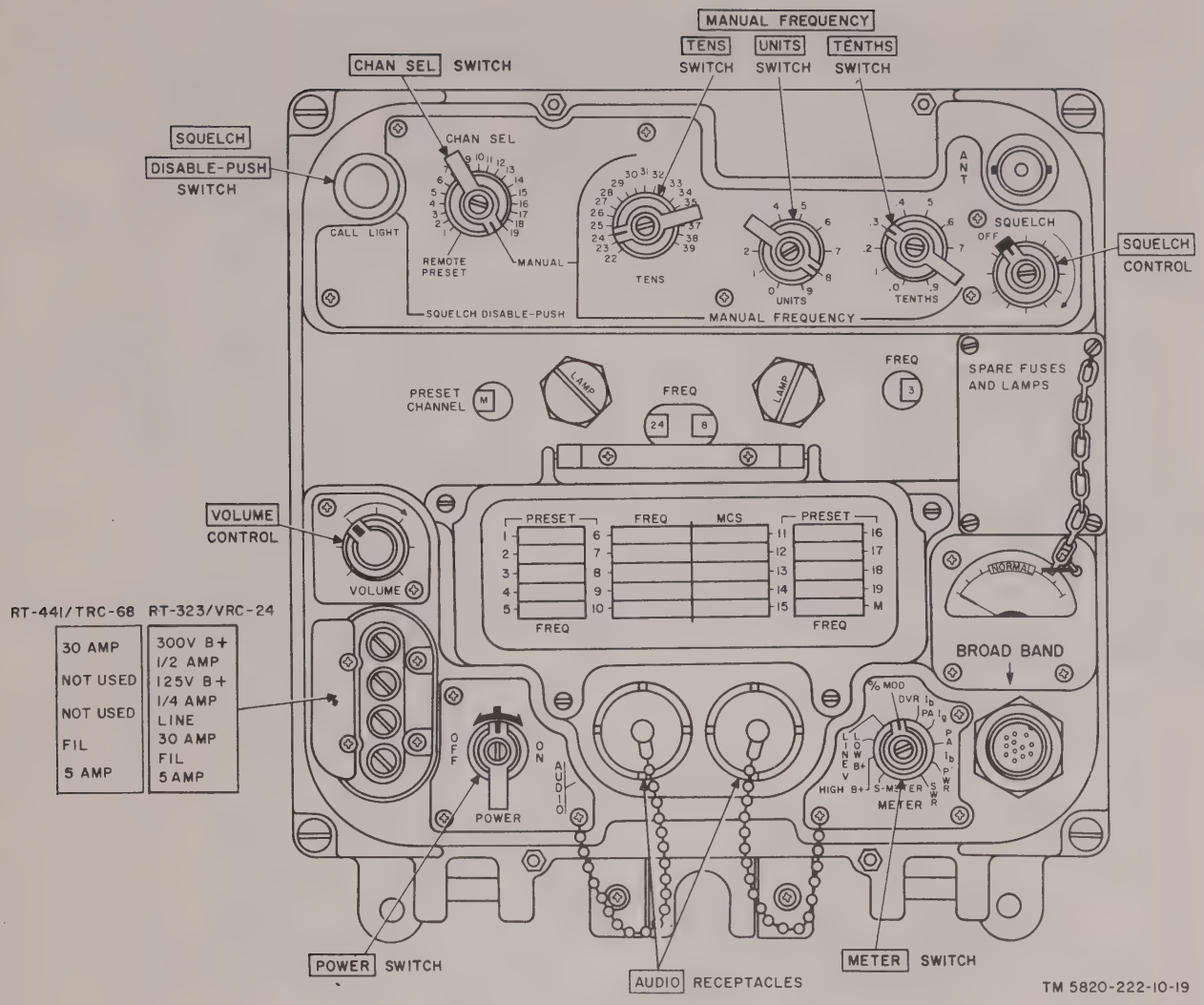

Figure 14. Receiver-Transmitters RT–323/VRC–24 or RT–441/TRC–68, controls, indicators, and receptacles.

the preset frequency selecting row corresponding to a digit of the desired frequency. Channel 4 in figure 16 is shown set for a frequency of 258.3 mc.

(1) The left-hand pin in the channel 4 slot is set over the number 2.

(2) The left-center pin is set over the number 5.

(3) The right-center pin is set over the number 8.

(4) The right-hand pin is set over the number 3.

f. Note the channel frequencies in the chart provided on the front of the memory drum access door.

23. Starting Procedure
(fig. 13 and 14)

a. Operate the POWER switch of the receiver-transmitter or the radio set control momentarily to ON.

b. Operate the METER switch to the LINE V position. The meter needle should indicate in the NORMAL range.

c. For preset-channel operation at the receiver-transmitter:

(1) Set the CHAN SEL switch to the desired channel.

(2) When the tuning cycle is complete (approximately 5 seconds), the desired channel number and channel

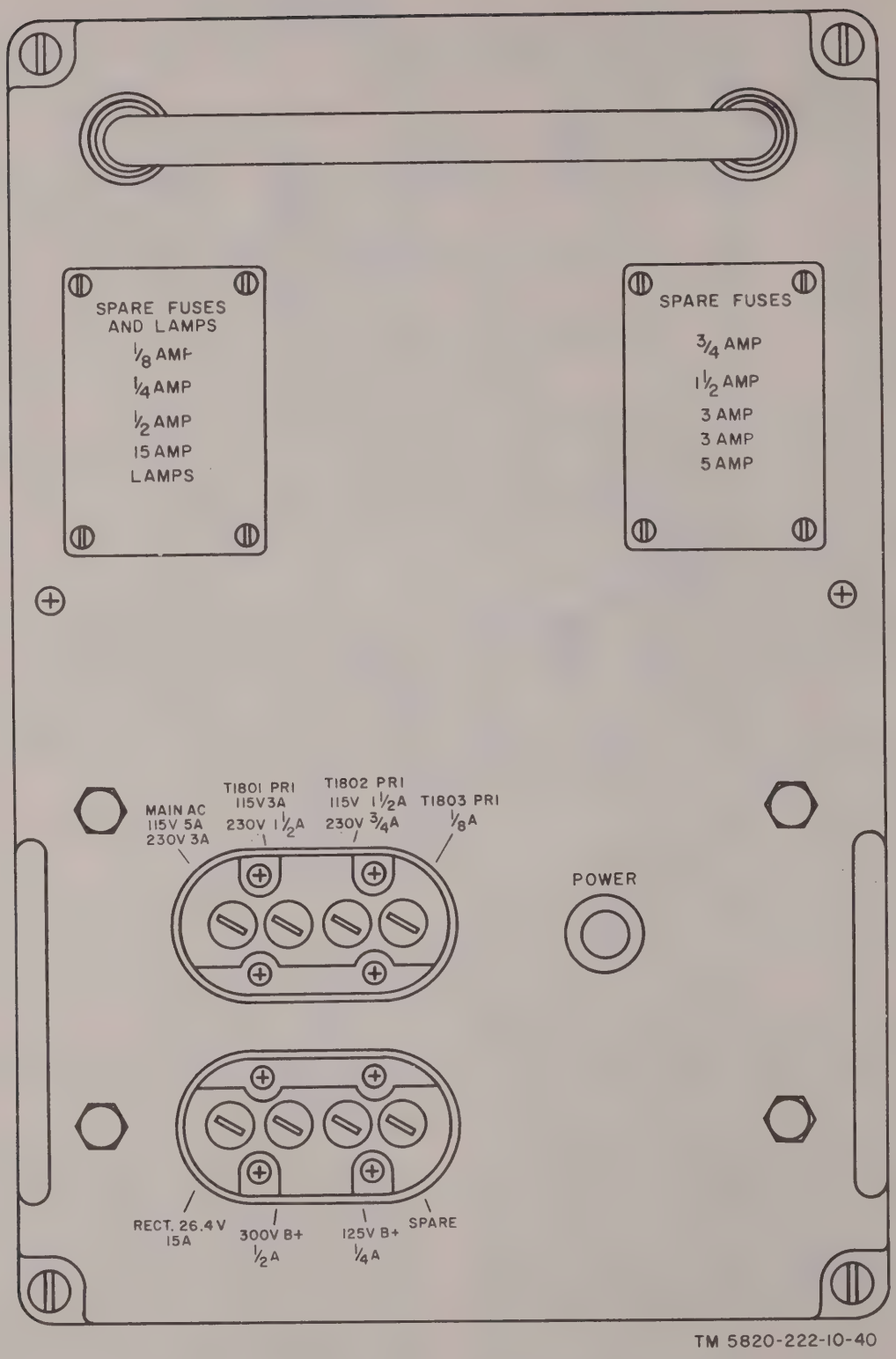

Figure 15. Power Supply PP–1494/U, front panel.

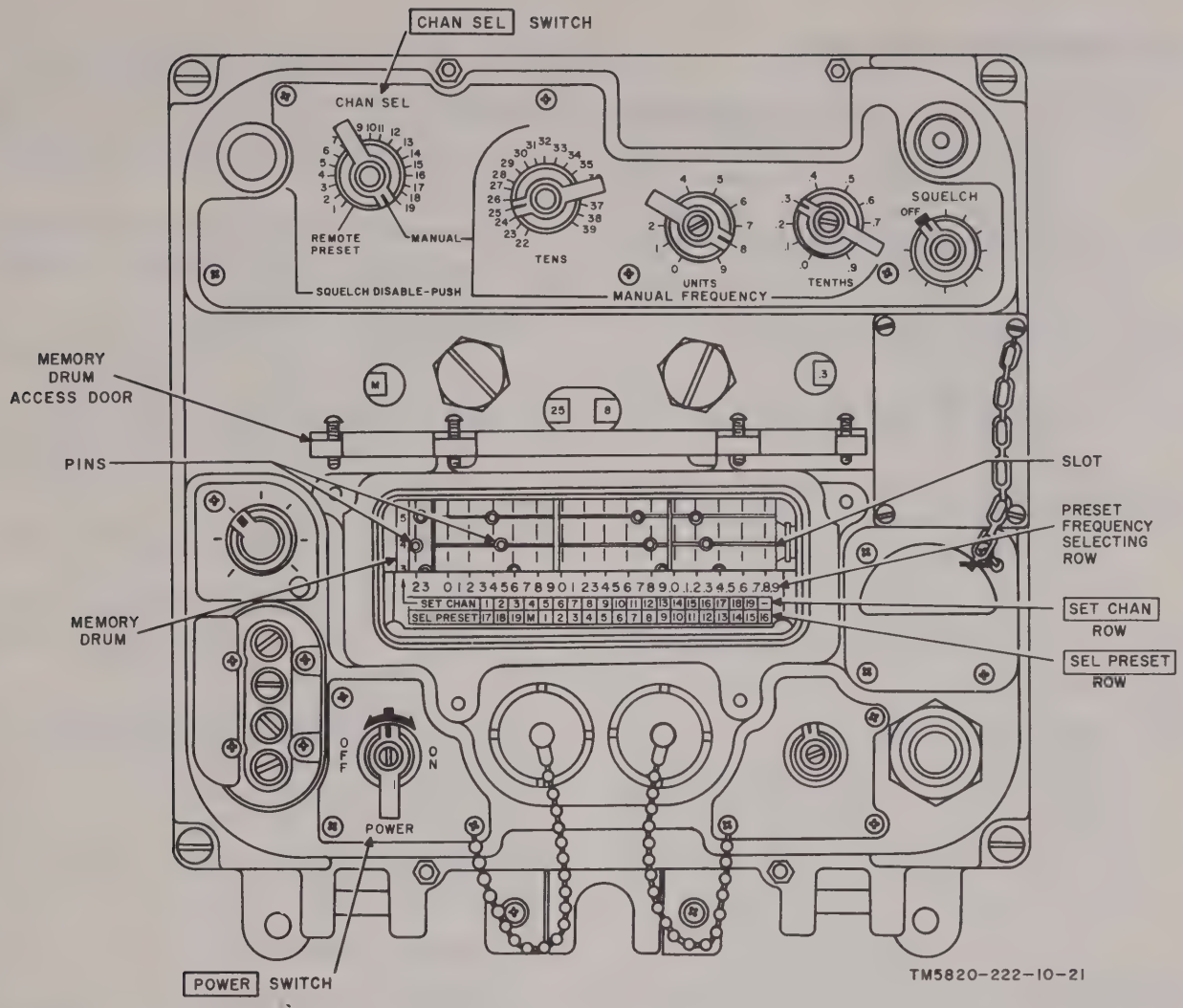

Figure 16. Receiver-Transmitter RT–323/VRC–24 or RT–441/TRC–68, memory drum access door open.

frequency are indicated in the PRESET CHANNEL and FREQ windows.

(3) The indication in the FREQ windows should correspond to the frequency marked on the chart on the memory drum access door.

d. For manual frequency operation:

(1) Set the CHAN SEL switch to MANUAL.

(2) Set the MANUAL FREQUENCY switches to the desired frequency.

Example: To select 325.4 mc, set the TENS switch to 32, UNITS switch to 5, and TENTHS switch to .4.

(3) When the tuning cycle is complete, the frequency is indicated in the FREQ windows; the PRESET CHANNEL window indicates M.

e. For operation at the radio set control:

(1) Set the CHAN SEL switch at the receiver-transmitter to REMOTE PRESET.

(2) Set the CHANNEL selector switch at the radio set control to the desired channel.

f. After the desired preset channel or manual frequency is set, connect the microphone and the loudspeaker or headset to the AUDIO receptacles at the receiver-transmitter or the radio set control. The radio set is now ready for push-to-talk operation.

24. Radiotelephone Reception

a. Squelch.

(1) For average or strong signal reception, turn the SQUELCH control clockwise, with no incoming signal, until the CALL LIGHT goes out and the noise in the loudspeaker or headset just disappears.

(2) For weak signal reception, turn the SQUELCH control to OFF.

(3) To momentarily disable squelch operation, press and hold down the SQUELCH DISABLE-PUSH switch.

b. Volume.

(1) At the receiver-transmitter, use the VOLUME control to adjust the loudspeaker or headset output (fig. 14).

(2) At the radio set control, use either the PHONE VOLUME or SPEAKER VOLUME control as appropriate (B, fig. 13).

25. Radiotelephone Transmission

a. Operation at Receiver-Transmitter.

(1) Set the METER switch to % MOD.

(2) Operate the microphone push-to-talk switch and speak into the microphone.

(3) The meter should indicate in the NORMAL range while you speak.

b. Operation at Radio Set Control.

(1) Set the radio-interphone switch (A, fig. 13) to either the RAD or lock it in the RAD-INT position. On RAD-INT the transmitted speech is also heard over the interphone system.

(2) Operate the microphone push-to-talk switch and speak into the microphone.

c. Operation at the AN/GRA-6 (AN/TRC-68 only).

(1) Set the switches on the AN/GRA-6 for the desired operation as directed in TM 11-5038.

(2) Set the radio-interphone switch on the radio set control for the desired operation (RAD or RAD-INT).

(3) Operate the push-to-talk switch on the AN/GRA-6 handset and speak into the microphone portion of the handset.

26. Interphone Operation at Radio Set Control

a. Set the radio-interphone switch to INT.

b. Operate the microphone push-to-talk switch and speak into the microphone.

c. Communication is provided between the positions at the radio set control, the receiver-transmitter, and the interphone portion of Radio Sets AN/GRC-3 through -8.

d. In the RAD-INT position, the transmitted speech is also heard over the interphone system (para. 25*b*).

27. Stopping Procedure

To shut off the radio set, momentarily set the POWER switch on the radio set control or the receiver-transmitter to OFF.

CHAPTER 3

MAINTENANCE INSTRUCTIONS

28. Scope of Operator's Maintenance

a. The following is a list of maintenance duties normally performed by the operator of the AN/VRC-24 or AN/TRC-68. The operator requires no special tools or equipment.

b. Operator's maintenance for the AN/VRC-24 and AN/TRC-68 consists of the following:

(1) Preventive maintenance (para. 29).

(2) Visual inspection (para. 30).

(3) Operational checklist (para. 31).

(4) Checking cable connections (fig. 3 and 4).

29. Preventive Maintenance

a. DA Form 11-238. DA Form 11-238 (fig. 17) is a preventive maintenance checklist to be used by the operator. Items 1 through 4 are checked daily, and items 5 through 11 are checked weekly by the operator. Items not applicable to the radio set are lined out. Follow the instructions on the form.

b. Items. The information shown in this subparagraph supplements DA Form 11-238. The item numbers correspond to the ITEM numbers on the form.

Item	Maintenance procedure
2	Use lint-free cloth to remove dust, dirt, moisture, and grease from the front panel surfaces and controls. If necessary, wet the cloth with Cleaning Compound (Federal stock No. 7930-395-9542). Wipe the parts with a dry, clean cloth.
3	Check the spring-return action of the POWER and SQUELCH DISABLE-PUSH switches.

Warning: **Cleaning compound is flammable and its fumes are toxic. Do not use near a flame; provide adequate ventilation.**

30. Visual Inspection

a. When the equipment fails to perform properly, turn off the power and check all the items listed below. *Do not check any item with power on.*

(1) Incorrect setting of switches and controls.

(2) Power cable or signal cords disconnected or poorly connected.

b. If the above checks do not locate the trouble, proceed to the operational checklist (para. 31).

31. Operational Checklist

a. General. The operational checklist will help the operator locate the trouble quickly. Use the corrective measures listed to correct troubles. If the measures suggested do not restore normal equipment performance, troubleshooting by a higher echelon repairman is required. Note on the repair tag what corrective measures were taken and how the equipment performed at the time of failure.

b. Procedure (fig. 14).

(1) Connect the headset or loudspeaker and the microphone to the AUDIO connectors.

(2) Set the METER switch to the S-METER position.

(3) Turn the SQUELCH control to OFF.

(4) Set the VOLUME control to midrange.

(5) Perform the steps shown in *c* below, in the order listed. *All steps refer to both Radio Sets AN/VRC-24 and AN/TRC-68 unless otherwise noted.* They are performed at the receiver-transmitter front panel. If the steps in *c* below yield normal performance and operation from the remote position is abnormal, the radio set control or connecting cable requires higher echelon repair. Observe equipment operation and perform any corrective measures necessary.

LEGEND for marking conditions:
Satisfactory, ✓.
Adjustment, Repair or Replacement required, X.
Defect corrected, (X).

DAILY CONDITION FOR MONTH OF

NO.	DAILY ITEM	1 RB 17	2 RB 18	3 RB 19	4 RB 20	5 RB 21	6 OD 22	7 OD 23	8 RB 24	9 RB 25	10 RB 26	11 RB 27	12 RB 28	13 OD 29	14 OD 30	15 31	16	2D 3D ECHELON
1.	COMPLETENESS AND GENERAL CONDITION OF EQUIPMENT. *(Transmitter, receiver, carrying cases, wire, cables, microphones, tubes, spare parts, technical manuals).*	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓			
2.	CLEAN DIRT AND MOISTURE FROM ANTENNA, MICROPHONES, HEADSETS, ~~KEYS~~, JACKS, PLUGS, COMPONENT PANELS.	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓			
3.	INSPECT CONTROLS FOR NORMAL OPERATION. ~~TAP CONTROLS LIGHTLY FOR EVIDENCE OF CUT-OUT FROM LOOSE CONTACTS.~~	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓			
4.	CHECK FOR NORMAL OPERATION OF EQUIPMENT. BE ALERT FOR UNUSUAL OPERATION OR CONDITION.	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓			

WEEKLY	CONDITION EACH WEEK 1ST	2D	3D	4TH	5TH	2D 3D ECH
5. CLEAN AND TIGHTEN EXTERIORS OF CASES, ~~RACKS~~, MOUNTS, ~~TRANSMISSION LINES~~.	✓	✓				
6. INSPECT CASES, MOUNTS, ANTENNA ~~TOWERS~~ AND EXPOSED METAL SURFACES FOR RUST, CORROSION.	✓	✓				
7. INSPECT CORDS, CABLE, WIRE, SHOCK MOUNTS FOR CUTS, KINKS, BREAKS, FRAYING, UNDUE STRAIN.	(X)	✓				
8. ~~CHECK ANTENNA GUY WIRES FOR PROPER TENSION OR DAMAGE~~.						
9. INSPECT CANVAS ~~AND LEATHER~~ ITEMS FOR MILDEW, TEARS, FRAYING.	✓	✓				
10. INSPECT ACCESSIBLE ITEMS FOR LOOSENESS: SWITCHES, KNOBS, JACKS, CONNECTORS, ~~RELAYS, TRANSFORMERS, MOTORS~~, PILOT LIGHTS, ~~BLOWERS~~, ETC.	✓	✓				
11. CLEAN AND/OR INSPECT ~~AIR FILTERS~~, BRASS NAME PLATES, DIAL AND METER WINDOWS.	✓	✓				
12. ~~INSPECT STORAGE BATTERIES FOR DIRT, LOOSE TERMINALS, SPECIFIC GRAVITY, DAMAGED CASES. INSPECT DRY BATTERIES FOR LEAKAGE~~.						

ADDITIONAL ITEMS FOR 2D AND 3D ECHELON INSPECTIONS	CONDITION
13. INSPECT SHELTERS AND COVERS FOR ADEQUACY OF WEATHER-PROOFING, TEARS, FRAYING.	
14. CHECK TERMINAL BOX COVERS FOR CRACKS, DIRT, LEAKS, DAMAGED GASKETS, GREASE.	

ADDITIONAL ITEMS FOR 2D AND 3D ECHELON INSPECTIONS	CONDITION
15. INSPECT SEATING OF READILY ACCESSIBLE PLUCK-OUT ITEMS: TUBES, LAMPS, FUSES, CRYSTALS, CONNECTORS, VIBRATORS, PLUG-IN COILS.	
16. INSPECT RELAYS AND CIRCUIT BREAKERS FOR LOOSE MOUNTINGS, BAD CONTACTS, MIS-ALINEMENT OF CONTACTS AND SPRINGS, PROPER SPRING TENSION.	
17. INSPECT VARIABLE CAPACITORS FOR DIRT, MIS-ALINEMENT OF PLATES, LOOSE MOUNTINGS, MOISTURE.	
18. INSPECT RESISTORS, BUSHINGS AND INSULATORS FOR CRACKS, CHIPPING, BLISTERING, MOISTURE, DISCOLORATION.	
19. CLEAN AND TIGHTEN SWITCHES, TERMINAL BLOCKS, BLOWERS, RELAY CASES AND INTERIORS OF CHASSIS AND CABINETS NOT READILY ACCESSIBLE.	
20. INSPECT TERMINAL BLOCKS FOR LOOSE CONNECTIONS, CRACKS AND BREAKS.	
21. INSPECT TERMINALS OF LARGE FIXED CAPACITORS AND RESISTORS FOR DIRT, CORROSION, LOOSE CONTACTS.	
22. INSPECT TRANSFORMERS, CHOKES, POTENTIOMETERS AND RHEOSTATS FOR OVERHEATING AND OIL LEAKAGE.	
23. INSPECT GENERATORS, AMPLIDYNES, DYNAMOTORS FOR BRUSH WEAR, SPRING TENSION, ARCING AND FITTING OF COMMUTATOR.	
24. INSPECT CATHODE RAY TUBES FOR BURNT SCREEN SPOTS.	
25. INSPECT WATERPROOF GASKETS FOR LEAKS, WORN OR LOOSE PARTS.	

CONTINUED ON PAGE 4

2 3

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Figure 17. DA Form 11–238, as used by operator.

c. Checklist

Step	Action	Normal indication	Corrective measures
1	Turn POWER switch to ON and release. ***Caution:*** **Do not hold POWER switch ON to operate set.**	CALL LIGHT, POWER lamp (on power supply of AN/TRC–68) and dial lamps light. Blower motor (s) start.	Check power cable to power source. Higher echelon repair required.
		Receiver noise heard in headset or loudspeaker after short interval.	Connect headset or loudspeaker to other AUDIO receptacle. Check headset or loudspeaker by substitution. If set remains inoperative, refer to steps 3 and 4 below.
2	Set METER switch to HIGH B+.	Meter indicates in NORMAL range.	Higher echelon repair required.
3	Set METER switch to LOW B+.	Meter indicates in NORMAL range.	Higher echelon repair required.
4	Operate CHAN SEL switch to several channels. Operate CHAN SEL switch to MANUAL and set MANUAL FREQUENCY controls to several channels.	PRESET CHANNEL and FREQ windows indicate correct channel and frequency.	Turn set off. Check to see whether channels are preset correctly on memory drum (par. 22). If preset channels are set correctly and indications for manual channels are not correct, higher echelon repair is required.
5	Press microphone push-to-talk switch. Set METER switch to DVR I_0, PA I_g, PA I_b, PWR and SWR.	Call LIGHT goes out and meter indications are in NORMAL range, except in SWR. In SWR, meter indicates between 0 and 15 percent of full scale.	Check antenna cable connections in case of PWR and/or SWR abnormal indication(s). Interchange microphone and loudspeaker or headset connections. Higher echelon repair required.
6	Set METER switch to % MOD. Press push-to-talk switch and speak into microphone.	During speech, meter indicates in NORMAL range and sidetone is heard.	Interchange microphone and loudspeaker or headset connections. Higher echelon repair required.
7	Turn SQUELCH control clockwise.	CALL LIGHT goes out and noise in headset or loudspeaker disappears.	Higher echelon repair required.
8	Operate POWER switch to OFF and release.	All lights go out, blower motor(s) stop, and receiver noise disappears.	Remove line plug from power source (AN/TRC–68). Higher echelon repair required.

CHAPTER 4

DEMOLITION OF MATERIEL TO PREVENT ENEMY USE

32. Authority for Demolition

Demolition of the equipment will be accomplished only upon the order of the commander. The destruction procedures outlined in paragraph 33 will be used to prevent further use of the equipment.

33. Methods of Destruction

Any or all of the methods of destruction given below may be used. The time available will be the major determining factor for the methods to be used in most instances when destruction of equipment is undertaken. The tactical situation also will determine in what manner the destruction order will be carried out.

a. Smash. Smash the crystals, controls, tubes, coils, switches, capacitors, transformers, loudspeaker, microphones, and headsets; use sledges, axes, hammers, or crowbars.

b. Cut. Cut cords, cables, headsets, and wiring; use axes, machetes or bayonets.

c. Burn. Burn cords, cables, resistors, capacitors, coils, wiring, and technical manuals; use gasoline, kerosene, oil, flamethrowers, or incendiary grenades.

d. Explode. If explosives are necessary, use firearms, grenades, or TNT.

e. Dispose. Bury or scatter the destroyed parts in slit trenches or foxholes or throw them into streams.

APPENDIX I.

REFERENCES

AR 700-38	Unsatisfactory Equipment Report (Reports Control Symbol CSGLD-247 (R2)).
AR 700-58	Report of Damaged or Improper Shipment
DA PAM 108-1	Index of Army Motion Pictures, Film Strips, Slides, and Phono Recordings
DA PAM 310-4	Index of Technical Manuals, Technical Bulletins, Supply Bulletins Lubrication Orders, and Modification Work Orders.
FM 21-5	Military Training
FM 21-6	Techniques of Military Instruction
FM 21-30	Military Symbols
SR 320-5	Dictionary of United States Army Terms
SR 320-50	Authorized Abbreviations and Brevity Codes
TM 11-284	Radio Sets AN/GRC-3, -4, -5, -6, -7, and -8.
TM 11-5038	Control Group AN/GRA-6

BY ORDER OF THE SECRETARIES OF THE ARMY AND THE AIR FORCE:

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Chief of Staff.

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US ARADCOM Rgn (2)
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EUSA (5)
Corps (2)
USASCS (25)
JBUSMC (2)
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  1–17 (2)
  1–57 (2)
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  11–55 (2)
  11–57 (2)
  11–95 (2)
  11–96 (2)
  11–98 (2)
  11–99 (2)
  11–117 (2)
  11–155 (2)
  11–500 (Tms AA-AE) (2)
  11–557 (2)
  11–587 (2)
  11–592 (2)
  11–597 (2)
  17 (2)
  17–22 (2)
  17–25 (2)
  17–26 (2)
  17–45 (2)
  17–46 (2)
  17–51 (2)
  17–52 (2)
  17–55 (2)
  17–56 (2)
  17–65 (2)
  17–66 (2)
  17–85 (2)
  17–86 (2)
  39–51 (2)
  39–52 (2)
  55–57 (2)
  57 (2)
  57–5 (2)

NG: State AG (3); Units — Same as Active Army except allowance is one copy to each unit.

USAR: None.

For explanation of abbreviations used see AR 320–50.

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